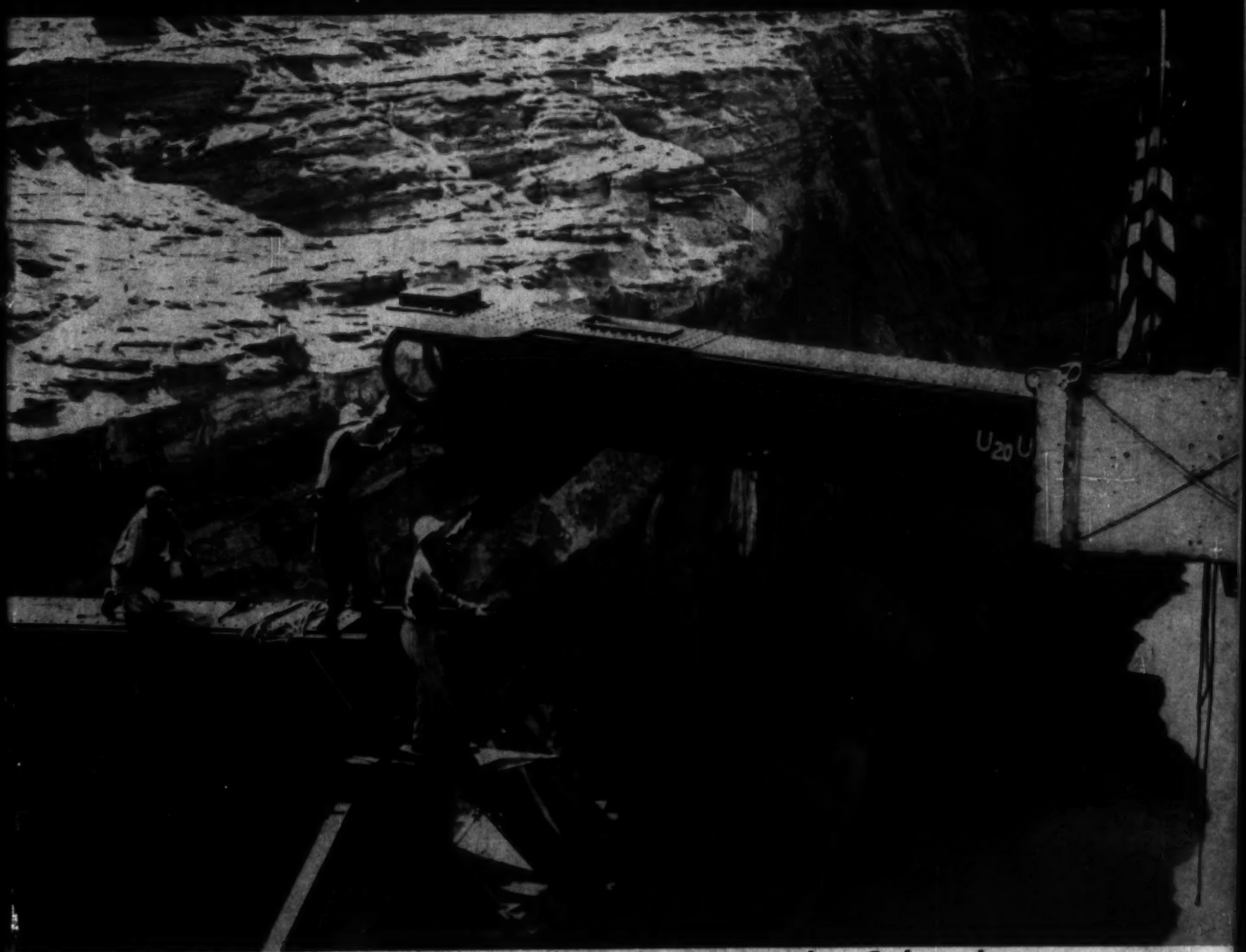
ENGINEERING NEWS-RECORD



Arch bridge closure: 700 feet over the Colorado p.34

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Horton Watersphere® and Waterspheroids® now grace the skyline over hundreds of progressive communities because they meet today's municipal standards for dependable performance and ease of maintenance . . . in a handsome, functional "package".

The all-welded structures require little ground space for foundations and bases can be used for pumping or storage. They are easy to paint and maintain . . . and their *modern designs* meet the aesthetic standards of *modern communities.*

Waterspheres and Waterspheroids have become landmarks of dependable gravity water supplies and symbols of progress . . . for America's water-wise communities.

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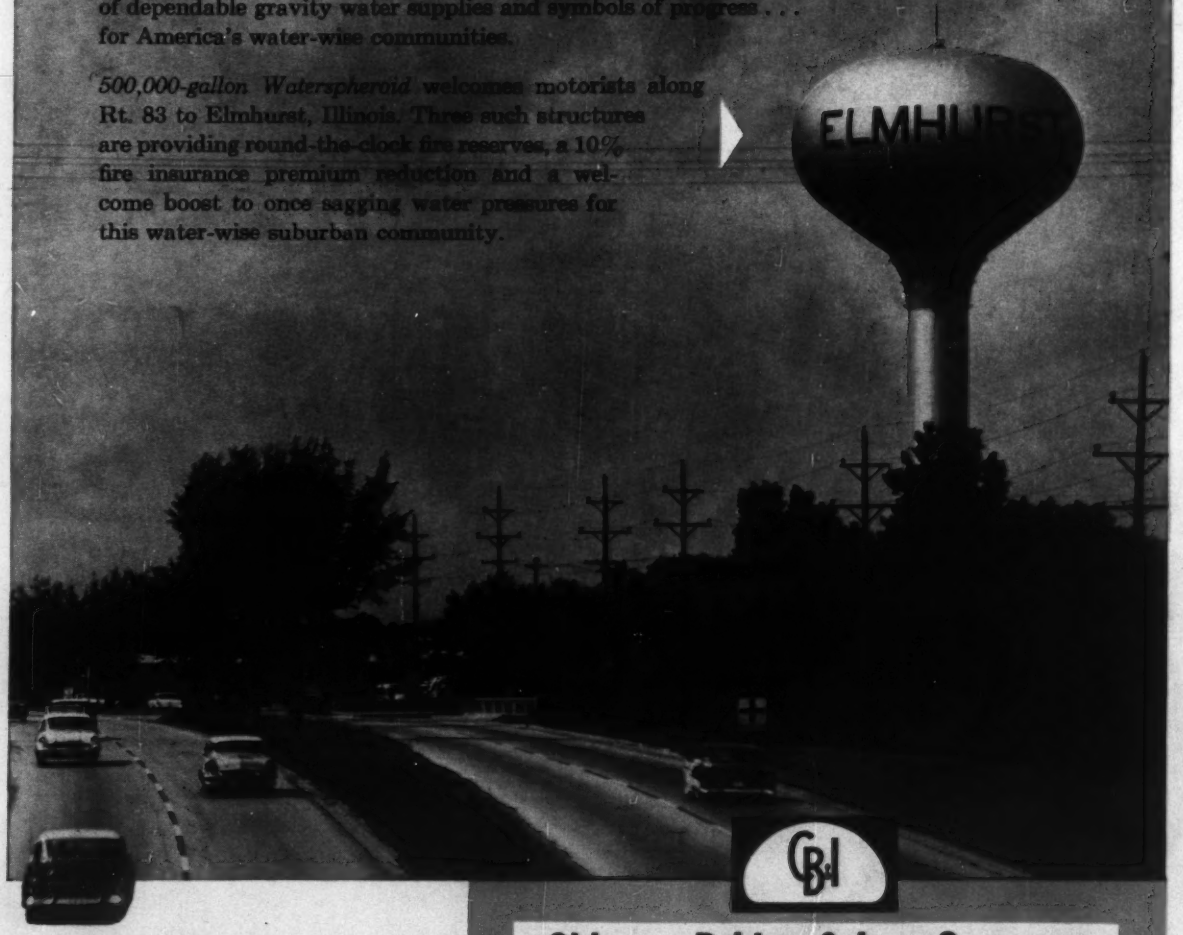

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M53C

Installing Bethlehem rock bolts in tunnel roof. *General Contractors and Engineers:* James McHugh Construction Co.

Wedge-Type Bolts Support Roof of Buffalo Sewer Tunnel

A new storm relief sewer in Buffalo, N. Y., provides additional protection for property in a semi-business area. The horseshoe-shaped tunnel, authorized by the Buffalo Sewer Authority, was bored through solid Onandaga limestone. It is approximately 9 ft in diameter, and about 6800 ft long. Bethlehem slotted rock bolts were used in the tunnel roof, to provide firm support.

BOLTS LOCK ROCK SLABS TIGHTLY

Bethlehem rock bolts are ideal for supporting tunnel roofs because they lock together stratified rock slabs. They are strong, easy to install, and provide an extra margin of safety.

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Bethlehem also produces ⅝-in. and ¾-in. diam headed rock bolts, used with an expansion shell and a steel plug. When this bolt is tightened, the plug is drawn down on the threads, expanding the serrated leaves of the shell.

If you have any question about the use of Bethlehem rock bolts, or rock bolt accessories, all you need do is get in touch with the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY
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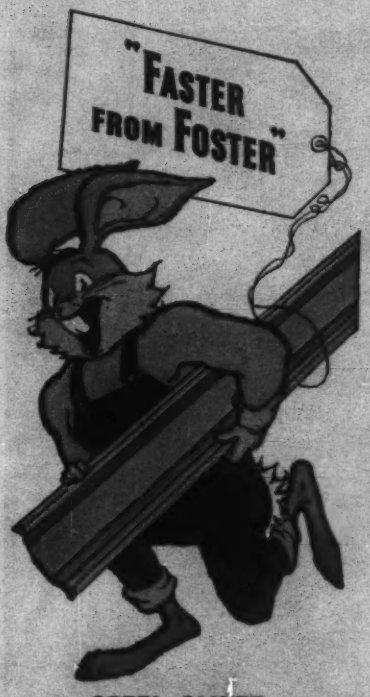

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A&P Supermarket, Ashland, Kentucky. 82 x 140 foot wall bearing V-LOK frame. Erection time for steel framing only 4 days.

KROGER	A&P	EVANS
Architect: Stewart R. McKalip, South Charleston, W. Va.	Architect: A&P Staff Architects	Architect: Dean, Dean & Paules, Huntington, W. Va.
Contractor: Bowers & Chilton, Inc., South Charleston, W. Va.	Contractor: W. B. Fossen & Son, Ashland, Ky.	Contractor: W. B. Fossen & Son, Ashland, Ky.

V-Lok Design Manual is available.

Evans Supermarket, Ashland, Kentucky. 102 x 194 foot wall bearing V-LOK frame. Erection time for steel framing—one week.

MACOMBER

CANTON 1, OHIO

WHEN AMERICA BUILDS FOR ECONOMY . . . IT BUILDS WITH CONCRETE

Design: Bridge Section, Ft. Worth District, Texas Highway Department
Contractors: Austin Bridge Company, Dallas, Texas and Worth Construction Company, Ft. Worth, Texas

FOUR-LEVEL INTERCHANGE AT FORT WORTH . . .

reinforced concrete bridges provide needed clearances with minimum over-all height

To meet Interstate standards for this direct-connect interchange in a restricted right-of-way, Texas highway engineers chose the shallowest possible construction. (Minimum vertical clearance for each deck is 14 ft. 6 in.) They used 2,945 linear feet of reinforced concrete bridges, of haunched slab design. These structures with their clean lines are attractive as well as efficient.

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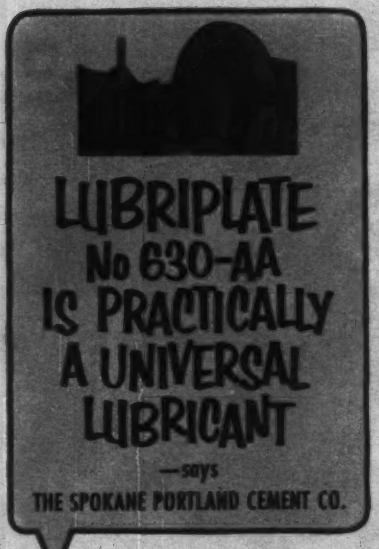

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Masonry Promotion: Good, But . . .

SIR—In your article, "Emphasis on Industry Promotion" (ENR, Oct. 23, p. 87), you point out a new labor-contractor-manufacturer teamwork plan to promote masonry construction. In the article you quote Mr. Douglas Whitlock, Chairman of the Board of Structural Clay Products Institute, as summing up the cooperative efforts of these three groups as follows:

"No other segment of the construction industry can show a greater degree of teamwork for a common goal than ours."

I certainly want to protest this presumptive statement by Mr. Whitlock.

We are more than happy to see the unions, contractors, and manufacturers in the masonry field joining together in a promotional campaign, but for Mr. Whitlock to say that no other segment of our industry has greater teamwork is far from true.

Since 1952 the lathing and plastering industry has been engaged in an international promotional effort. In that year, the contractors' association joined with two of our international unions (the Plasterers and the Lathers) to establish the National Bureau for Lathing and Plastering.

Today the National Bureau and its more than 100 local bureaus is spending several million dollars annually and every cent of this is controlled by a joint labor-management board in each of the local areas. The National Bureau itself has a Board of Directors composed of members of the contractors' association and the two international unions. In June a third international union was added to the Board of Directors, namely the Bricklayers' International Union.

For about five years now approximately thirty manufacturers have also been part of the National Bureau for Lathing and Plastering and less than two years ago all of the major manufacturers of metal lath, gypsum, vermiculite, perlite, and finishing lime, joined with the National Bureau and the international unions to form a separate organization known as the Lathing and Plastering Industry Committee.

This Committee, with headquarters in Princeton, New Jersey, is developing an industry architectural manual for the use of architects, builders, and others.

The Board of Directors of the Lathing and Plastering Industry Committee is made up of our contractors' organization, the international unions, and all major manufacturers in the industry.

We commend the masonry industry for its forward step in promoting brickwork and other masonry construction, but I believe the above clearly indicates that teamwork of a very high degree has existed in the lathing and plastering industry for at least six years and developed considerably during that period.

JOE M. BAKER, JR.
Executive Secretary
Contracting Plasterers' and Lathers' International Association
Washington, D. C.

Great Lakes Gaining in Runoff

SIR—Practically all discussion relative to water levels in the Great Lakes has to this date been in the nature of the effect of withdrawals of water for municipal domestic use. Damage is claimed by some interests due to this type of withdrawal.

One fact that should not be overlooked, however, is that accelerated surface drainage into the Great Lakes can be considered as an offset to these withdrawals for domestic purposes. This artificial influence tending to raise lake levels has not been publicized. In all the cities and drainage districts tributary to the Great Lakes water basin a very large amount of accelerated drainage is caused by improvements made to natural drainage ditches, rivers, and by the installation of storm water drains.

Certainly a considerable amount of water now reaches the Great Lakes which under prior conditions was retained in ponds, swamps and as ground water dissipated by wide area evaporation as well as by seepage through the ground to the Great Lakes.

In the case of the Great Lakes, this increased and accelerated runoff caused by drainage works is not a material damaging influence. In some river

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In short, here's where each scraper will fit best for maximum production at lowest cost per yard: The No. 482—in good loading conditions and haul roads of minimum grades and low rolling resistance. The No. 456—on adverse grades and average-to-high resistance haul road conditions.

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basins the same causative factors have, however, been held to cause a considerable increase in flood heights and downstream damage.

To a certain extent every Great Lakes city and every other tributary area with accelerated run-off facilities could be considered as contributing to a damaging rise in lake levels during those periods when the levels are causing property damage, as has been the case in some recent years.

The net effect of the two influences of artificial increased run-off and artificial diversion for domestic purposes may well be a stalemate. Either factor would be more of an influencing item if they were not counterbalancing each other.

GEORGE O. CONSOER
and
ARTHUR W. CONSOER
Consoer, Townsend & Associates
Chicago, Ill.

Wanted: Standard Code

SIR—Your article "Industry Splits on ASA Housing Code" (ENR Sept. 18, p. 24), indicates that the National Board of Fire Underwriters objected to initiating an ASA project for development of a standard on one and two-family dwellings. Actually, the National Board did not raise any objection to the initiation of such a project. In order that you may fully understand our position, we would like to repeat the statement made at the beginning of our comments at the conference:

"The National Board of Fire Underwriters is ready to cooperate in any effort to coordinate building-code requirements for one and two-family dwellings, but we wish to make certain comments on the proposal as presented."

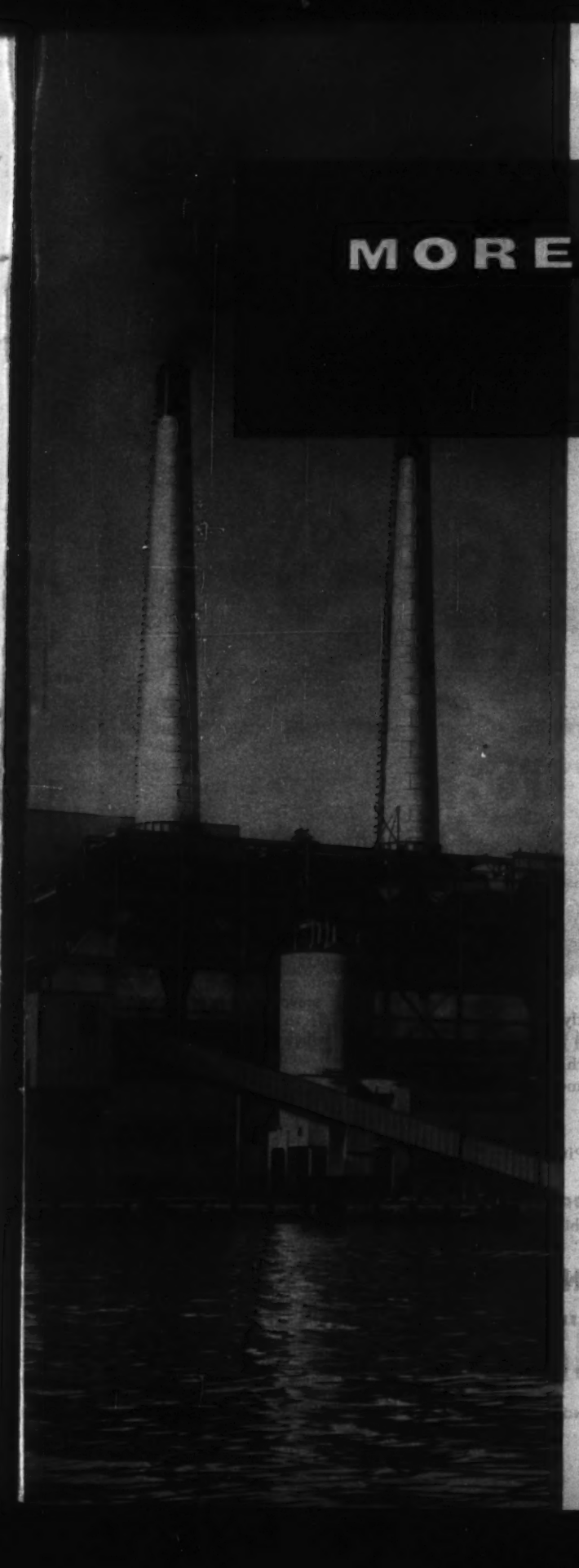
We would also like to call your attention to the fact that the National Board did not vote against the resolution calling for the initiation of a project for the establishment of a standard for one and two-family dwellings but had officially asked to be recorded as "not voting" on the resolution.

E. W. Fowler
Director of Codes and Standards
National Board of Fire Underwriters
New York City

The Test of a Conservative

SIR—There is a definite need for engineers to stop and think of what conservatism and factors of safety really mean.

Safety factors are involved in all elements of the engineer's work from the smallest to the largest detail. All stand-



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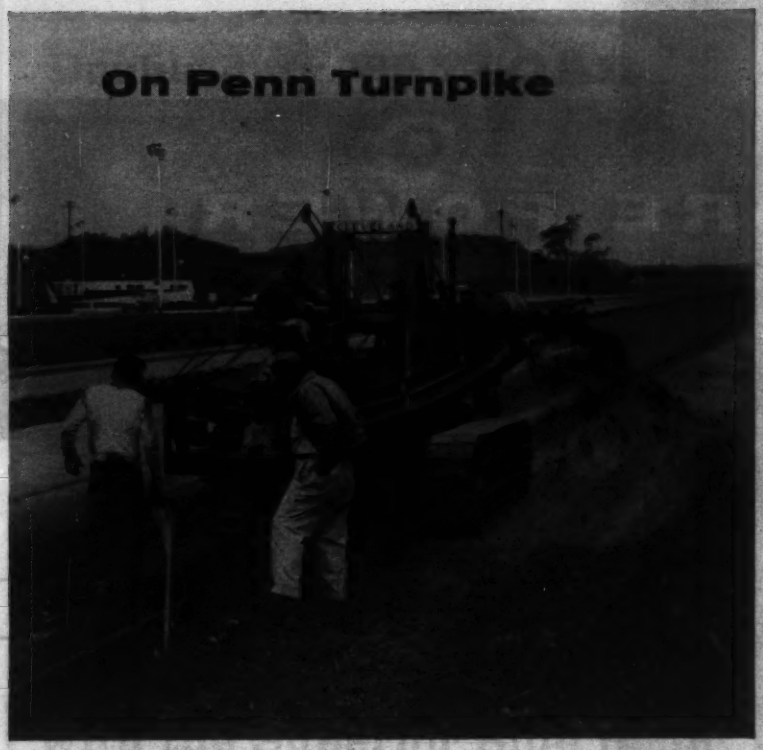

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The Digging .... in hard shale under 10 inches of tough aggregate in the shoulder of the pike.

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The Contractor.. Harrison Construction Co., Pittsburgh

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ards take into account the possibility of overloads or weaknesses that may creep in despite efforts to keep them out.

In a broad sense, some force is involved and the safety factor measures the engineering effort to keep it in proper control. These safety factors say, in effect, that good engineering practice—taking into consideration the likelihood of unexpected occurrences—establishes the limits of design achievements beyond which one should not go.

What is conservatism in engineering? Some men think of a "conservative" designer as one who uses engineering materials extravagantly, or one who provides abnormally high safety factors in his work. Others think of him as a good sound designer. If there is any standard reference available, it is probably in the standard safety factors of the profession. Designing to provide safety factors lower than standard could then be considered under-conservative, and providing increased safety could be considered ultra-conservative.

Engineers should stop using the word "conservative", or else give it unmistakable meaning.

Hugh F. Fenlon
Consulting Engineer
Atlanta, Ga.

Too Old To Teach?

SIR—Your editorial entitled "Source of Science Teachers" (ENR Nov. 13, p. 132) reminds me that the New York City Board of Education looked into this matter two years ago.

The problem of training engineers in the principles and practices of teaching was to have been solved by giving those engineers education courses during their engagements as teachers. However, an age limit prevented the plan from becoming effective.

A law which forces teachers to retire at 70 will continue to withhold from students that scientific knowledge which the retired engineer is capable of providing, even at an age over 70.

JAC C. HOLMAN
Consulting Engineer
Bayside, N. Y.

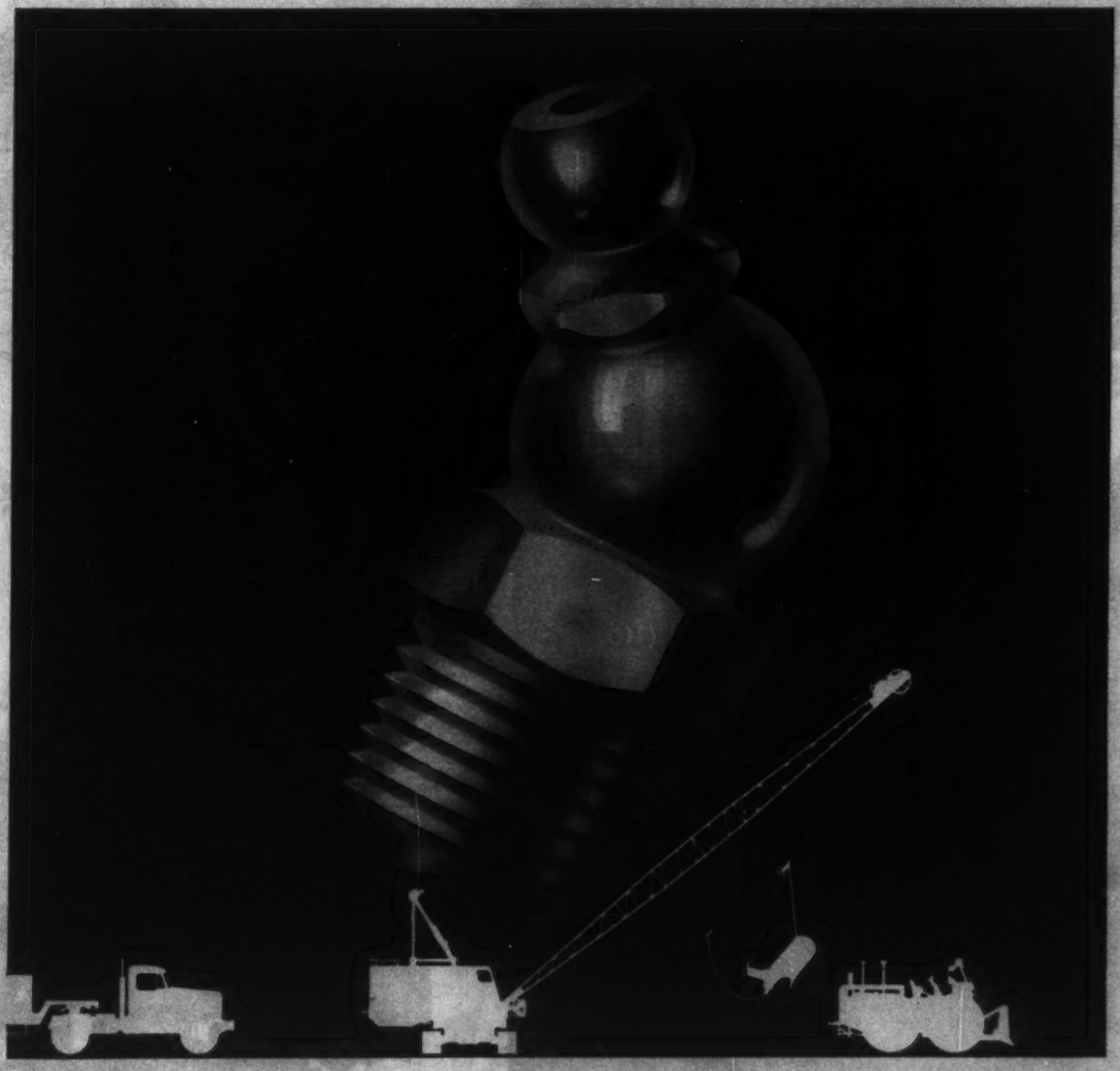
CALENDAR

The American Society of Mechanical Engineers, 78th annual meeting, New York Coliseum, New York City, Dec. 1-5.

American Association of State Highway Officials, annual meeting, Sheraton-Palace Hotel, San Francisco, Dec. 1-5.

Fourth National Construction Industry Conference, "Creative Trends in Urban Building," Hotel Sherman, Chicago, Ill., Dec. 10-11.

National Concrete Masonry Association, 1959 convention and biennial Concrete Industries Exposition, Public Auditorium, Cleveland, Ohio, Jan. 12-15.



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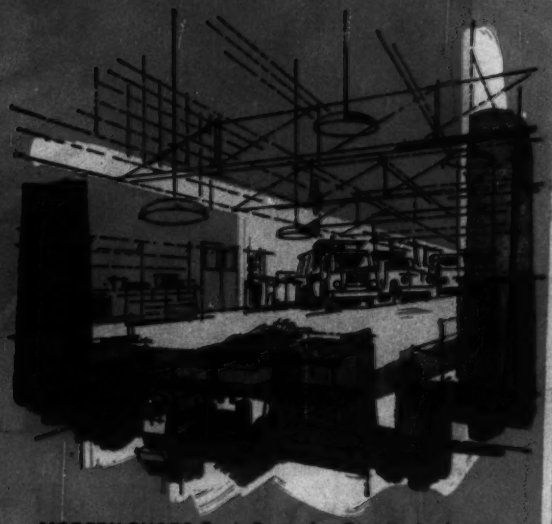

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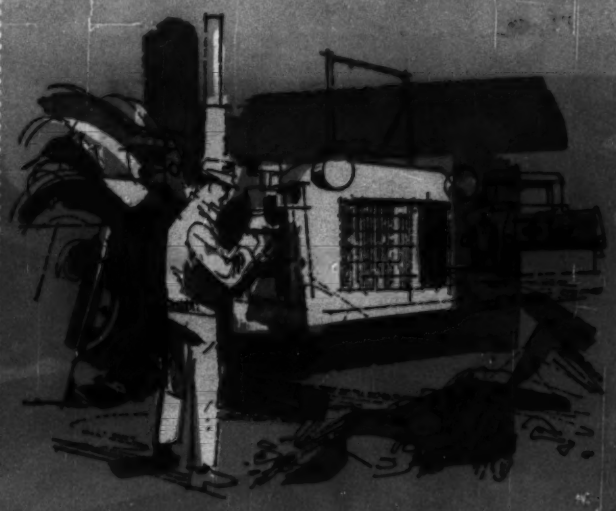

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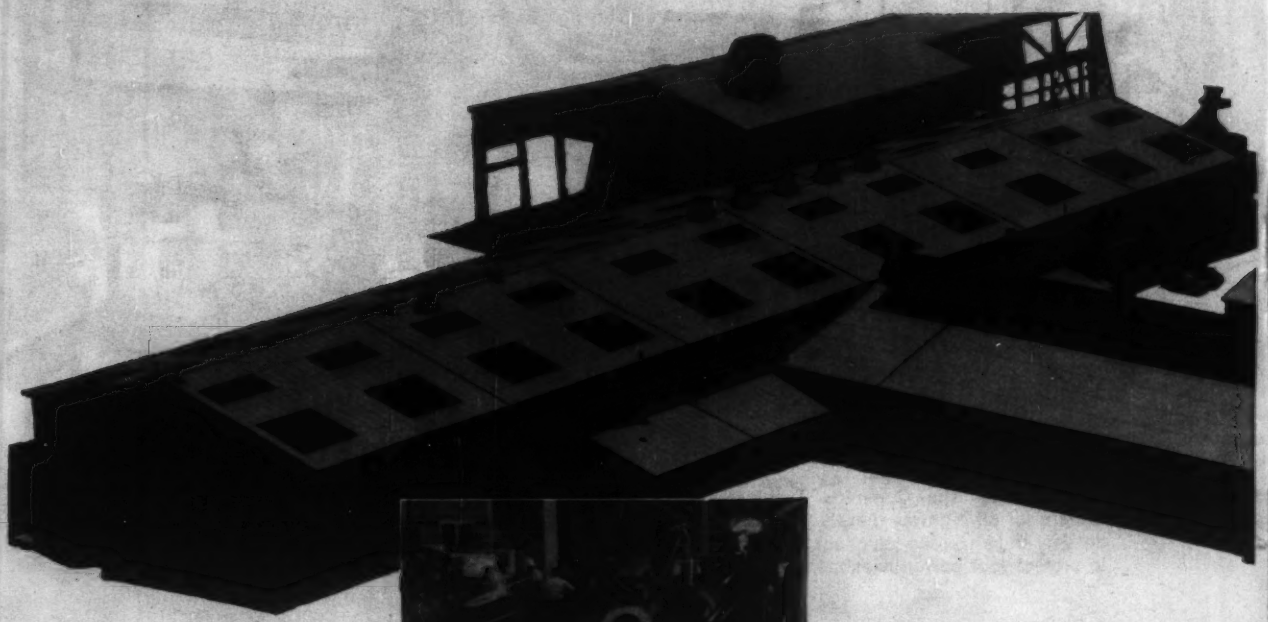
gives you the big plus



Using the metal mold process, the new casting machines at Bensenville include many patented improvements which are unique with Clow.

Testing is a continuous phase of the manufacturing process. All Clow pipe is subjected to a hydrostatic test of 500 lbs. per sq. inch of water pressure—2 to 4 times the normal working pressure.

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Clow cast iron pipe quality is assured by automatic instrument control during manufacture. In some cases, these control systems were developed exclusively for Clow.

Pipe annealing, a vital step in making Clow cast iron pipe, is carried out in this annealing oven —the most modern of its kind.

New Cast Iron Pipe Plant Begins Production to Meet Growing Midwest Market Demands

On September 22, 1958, the first pipe was poured at the new Bensenville, Illinois, Works of JAMES B. CLOW & SONS, INC., starting production at the most modern cast iron pipe plant in the world. The first plant ever constructed in the central states area for making cast iron pipe, Bensenville is located in suburban Chicago and is ideally situated to meet present and future demands for Clow pipe. By bringing producer and users hundreds of miles closer together, this new manufacturing plant will be able to deliver dependable Clow cast iron pipe *faster* for all construction needs. Bensenville is strategically located for shipment by rail, or by truck over the modern new highway network of the Chicago area. In addition, customers will benefit from new efficiencies of modern mass production in a plant located in an area central to vital raw materials for making cast iron pipe.

The inauguration of pipe production at Bensenville marks another step in Clow's continuing expansion program. Clow now operates pipe plants at Coshocton, Ohio, and Birmingham, Alabama, in addition to Bensenville. Bensenville is another major Clow investment in better products to better serve its customers.

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Tapping that involves no "bugs" may mean frustration to the woodpecker, but it spells economy and efficiency to the water works operator. This type of tapping comes naturally with Lock Joint Concrete Pressure Pipe.

Modern tapping equipment and technique have made the tapping of Lock Joint Concrete Pressure Pipe a simple, speedy operation. Small outlets for service connections, or larger ones for take-offs or cross connections, may be made under pressure with no danger of cross-threading or splitting the pipe.

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Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Semi-annual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

THE CONSTRUCTION WEEK

NYC: SCHOOL ISSUE STILL HOT—Two state agencies are now investigating charges of waste in the New York City school building program. The State Commission on Investigation and the Commissioner of Education are looking into the city controller's charge of $100 million wasted in the last seven years (ENR Nov. 27, p. 27).

DELAWARE: SCHOOL MORATORIUM—The Delaware Board of Education has declared a moratorium on new school construction until a basic building and equipment standard is drafted. The board is concerned that frills and special designs have made school costs unnecessarily high.

SAUCE FOR THE GOOSE—Alaska will have no billboards on any of its rural roads—federal-aid or otherwise. The 49th state restricted roadside advertising on federal-aid highways to pick up that 0.5% bonus. But owners of property along the federal-aid highways complained they were being discriminated against. So the Alaskan highway and public works board stretched the restriction to cover all rural roads.

NEW YORK HATCHES A-PLAN—The New York State Power Authority wants to get into the nuclear power business. The state would build a 400,000 to 500,000 kw nuclear plant on Lake Ontario. But the plan depends on the federal government coming through with subsidies to bring the state's share of the cost in line with the cost of conventional thermal plants.

MORE WILD TRADERS?—The counterpart to the used car dealer may yet appear in housing. The Federal Housing Administration will probably ask Congress for legislation making it easier to trade an old house for a new one. Builders, real estate brokers and some lenders are backing the idea.

THE ROAD TO JAIL—An Indiana jury took only 50 minutes last week to convict the former chairman of the state's highway commission of accepting a bribe. The ex-official, Virgil W. Smith, was charged with taking $7,793 from a salesman in connection with the state's purchase of $529,000 worth of road equipment. Smith was previously convicted of conspiracy to embezzle state funds. He is appealing both verdicts.

PIER DROPS CARGO—$50,000 worth of Japanese watches and binoculars plopped into the water when a 100-ft section of a 1,000-ft Brooklyn, N.Y., pier collapsed last week. Storms and high winds may have caused the collapse, according to a spokesman for the Bush Terminal Co., owner of the pier. An investigation to determine the exact cause is now under way.

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NEW P&H MODEL 1010 CRAWLER CRANE

features full 100-ton capacity at a practical 15 ft. radius with a 60 ft. heavy-duty boom.

High lifts with P&H special alloy 300 ft. boom (250 ft. boom, 50 ft. jib), and 200 ft. heavy-duty boom (150 ft. boom, 50 ft. jib).

Exclusive P&H Magnetorque® electro-magnetic swing, for smooth swings without whip-lash action.

Independent propel for maximum maneuverability on the job.

Low overall height. Less than 13 ft. with gantry in folded position. Less than 12 ft. with gantry removed.

Independent planetary boom hoist with one-directional cam clutches and safe, accurate planetary load lowering.

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Construction & Mining Division
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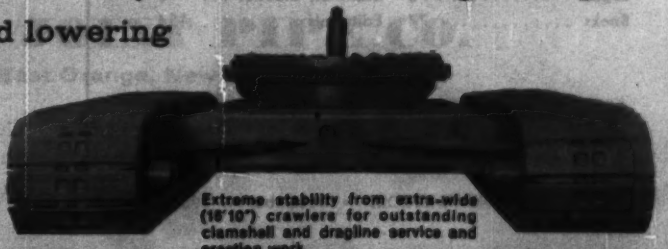
A rugged, tough erecting crane specially designed to make more profit on those big, high jobs. Now, there is no need for stationary hoists. Here's a machine that can move around on the job. With P&H Magnetorque swing, planetary boom hoist and load lowering more "profit-lifts" can be made every day. Check the profit opportunity of this P&H crane now.



Extreme stability from extra-wide (16'10") crawlers for outstanding clamshell and dragline service and erection work.

WASHINGTON OBSERVER

- Look for a drop in military construction
- Clash coming over federal airport aid

● **Pentagon officials now say military spending for construction for the year starting next July 1 will be down 10 to 15%** from this year's $2 billion level. This is a switch from the Defense Department prediction of just two months ago. Officials then said military construction expenditures could not be substantially reduced, that outlays would run at $2 billion for the next two or three years.

The turnabout reflects the Administration's intensified effort to trim the federal budget to offset the mounting deficit. The new cuts represent decisions to allow the SAC base dispersal program to wind up over the next 18 months and to keep missile base construction efforts at the current rate. About half the Air Force's construction budget will be earmarked for missile bases next year.

The outlook for new construction contract awards is for even sharper reductions—probably 20% below this year's $1.9 billion rate.

● **The Administration and Congress are headed for a collision on airport construction.**

Sen. A. S. Mike Monroney (D., Okla.) will re-introduce legislation to extend the federal aid program to fiscal 1963 with an over-all total of $275 million—$95 million for the first year, $60 million for the final three years. ($60 million a year is the current rate.)

This appeals to Congressional Democrats, and to airport operators (mainly cities). The bill sailed through Congress last session, but President Eisenhower vetoed it.

No one knows for certain, of course, what the Administration will propose. But it's likely to be substantially less than Senator Monroney's $275 million, which airport-airline officials generally believe is a minimum.

Under the current program—expiring June 30, 1959—the funds are apportioned like this: 75% for the states on an area-population formula; 25% for discretionary application by the Civil Aeronautics Administration on the basis of traffic growth and basic needs.

The Administration will propose federal aid for the biggest, busiest airports. Generally that means those that serve major population centers. They face the most serious and immediate problems with the advent of commercial jet aviation.

State officials and mayors, who will lobby vigorously for Senator Monroney's basic approach, argue that airport construction needs cannot be attributed to demands of the Jet Age alone; they insist it is also due to the tremendous post-war growth in the air transport business.

There is little doubt that Democrats can, if they wish, force through a Monroney-type bill. Whether they can override a Presidential veto is problematical, although Senator Monroney and others are already talking up the possibility.

There is a chance, however, that Democrats in Congress can compromise with the Administration on the issue. But it will have to be about $60 million a year or more.

(For more on airport construction, see p. 21.)

US RUBBER PILOT PIPE

UNDERWATER, UNDERGROUND—
this hose loves its salt diet

A large western salt company,* expanding its operations, faced an unusual problem recently: How to economically and efficiently move brine solution across the 600-ft. wide Napa River.

So they turned to 16" U.S. Rubber Pilot® Pipe.

Metal pipe could not be used because it would corrode quickly and because it lacked flexibility. But corrosion-resistant, flexible rubber Pilot Pipe has no trouble withstanding the salt water that has acid content with a PH ranging from 2.8 to 3.5. Moreover, it is flexible enough to follow the contour of the river bottom on which it lies and to handle any shifting due to river currents. Its sturdy cover is unaffected by both river silt and exposure to weathering (where it comes out of the water on either side of the river).

You'll find U.S. Pilot Pipe at work in a wide range of industries, in a wide variety of demanding uses. It's available to you at your "U.S." Distributor.

*Leslie Salt Co., Newark, Calif.

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Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

Huge jets, like this Boeing 707, need better ground facilities at airports. The result . . .

Jets Spark $1 Billion Bonus

Edward M. Young, Jr.
Associate Editor

The Jet Age is bringing a big increase for constructors who are interested in airport construction.

Jet-inspired construction will add up to a bonus of $1 billion in the next four to six years at 27 major airports alone.

Airport officials hope to spend more than $700 million of that total—they're confident of topping $600 million. Private airlines figure they'll have to put out about $400 million for ground installations and support facilities.

In addition, Congressional Democrats are expected to push hard again this year for a $275 million aid-to-airports program (see p. 19).

• **The big picture**—ENR surveyed the 30 U.S. airports considered most likely to handle commercial jets; queried 14 carriers that account for 95% of the commercial revenues of the U.S. airline industry; and studied government reports. Here are the findings:

• Not one U.S. airport is equipped to handle any volume of commercial jets efficiently.

• All the airports currently handling—or soon to handle—commercial jets are merely "adequate"—and only for limited operations.

• Almost every major airport in the country—including some of the newer ones—needs extensions to present runways, construction of completely new runways and taxiways, or both.

• A majority of the airports need additional ground support and terminal building facilities, such as passenger cargo buildings, overhaul bases, loading ramps and concourses.

• Most fields do not have high-speed turnoffs—essential for mass handling of jets.

• High intensity lights are not yet standard equipment at most airports. They're a must for night operation of jets.

• Facilities for fuel storage and distribution are too small, too slow, or both, in most cases.

• Several of the busiest airports—including Chicago's Midway, New York's La Guardia, Washington National and Cleveland—are too crowded or too limited in space to ever handle jets. Other facilities must be developed to serve these areas.

All these facts add up to a lot of construction. Airport officials know it—and they have made firm plans.

Take Detroit-Metropolitan Wayne County Airport as a high-class example. It has an "Intercontinental" rating—highest given by the Civil Aeronautics Authority. But officals will spend $25 million for improvements there.

New York International is spending $150 million. Chicago's O'Hare Field will spend $120 million. Washington's new International Airport at Chantilly, Va., is being planned for jets. Cost: $100 million.

Those are just a few examples. On the next two pages you'll find a summary of work going on and planned at 27 U.S. airports preparing for jets.

• **Here's what's needed**—The expected growth of jet air travel, and the particular needs of jet planes tell the story.

The airlines have ordered or will order $2.2 billion worth of jet equipment for delivery by 1962. Capacity of these jets then will be 61 billion passenger-miles a year—double today's total airline capacity. Jets are expected to handle two-thirds of air travel by 1962.

Competition for jet service is keen. Cities that don't plan facilities to handle them will become whistle stops on the air maps. That's why 27 of the airports surveyed by ENR are spending or plan-

ning to spend sums ranging from a few million up to $150 million each.

The need for such heavy outlays becomes more apparent when you look at the planes. The Boeing 707, now in operation, and Douglas DC-8 are the chief concern of airport operators today. Here are some facts about the 707, and what they mean to airport construction:

- **It weighs up to 295,000 lb** (Model 320, fully loaded).

This means runways must be figured for a 64,000-lb wheel loading. Most of today's runways were built for 24,000 lb; they need to be removed and replaced, or beefed up with overlays.

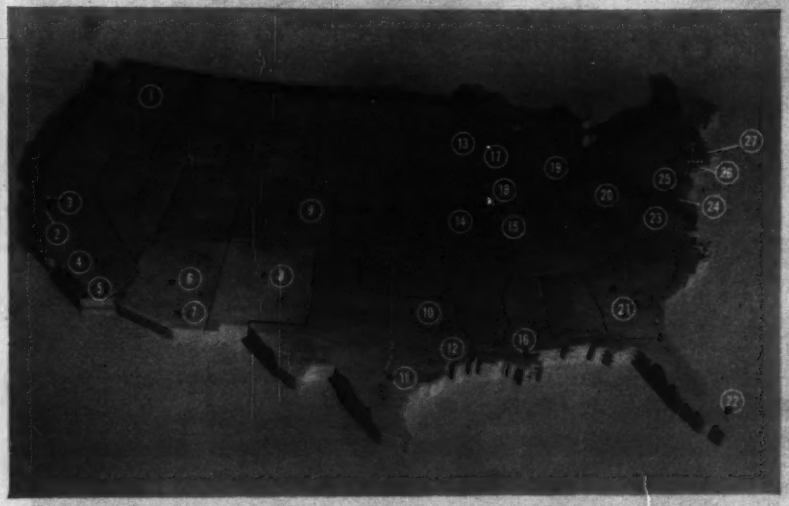
- **It requires runways as long as 10,500 ft and, in some cases, even 13,000 ft for long-range flights.**

Except for a few new fields, primary runways at today's airports run from 4,500 ft to 7,500 ft. Several airports have longer runways—but not a full system.

- **The engines cost about $250,000 each** and must be protected against sucking in foreign materials.

Taxiways on many airports are only 75 ft wide. This is wide enough for jet wheels, but not wide enough to prevent ingestion of rocks and sticks from adjacent unpaved areas. Minimum width of 125 ft is necessary.

- **It has an initial landing approach speed of 160 mph** and touches the ground at better than 130 mph.



These 27 airports plan $700 million in jet improvements.

. . . Here's How

1. Seattle-Tacoma Int'l

Future work: A $4 million improvement program will begin in 1960. Scheduled: 12 additional loading positions, conversion of terminal to two-level operation.

Current work: $3 million runway and taxiway project is almost done—the main strip was extended to 10,200 ft.

Jets coming late next year—probably Pan American Airlines.

2. San Francisco Int'l

Future work: Scheduled as part of a $25 million expansion program started in 1956: 30 more loading positions; more heliport loading positions; 5,500 additional auto parking spaces; $10 million-worth of terminal, cargo buildings, loading piers.

Current work: Three runways are being extended to 9,500, 9,000 and 7,130 ft.

Jets coming next year via American, Pan American and United. Field can handle them now.

3. Metropolitan Oakland Int'l

Future work: $17.5 million plan under way since 1955. Scheduled: New 10,000-ft runway; a $4 million passenger terminal building; heliport control tower; 1,000-car parking area; air freight building.

Current work: Placement of subbase and 1.25 million cu yd of fill.

No firm plans yet for commercial jets. Field will be ready by 1961.

4. Los Angeles Int'l

Future work: A $46 million program will add 1,600 acres of useable land. Scheduled: 5,000-car parking lot; passenger terminal and cargo structures; two high-speed concrete turnoffs; an 8,925 ft asphalt taxiway.

Current work: Extending instrument runway from 8,500 ft to 10,000 ft; rebuilding 7,000 ft of 8,500-ft roadway.

Jets coming next month via American. Jets of two other airlines will be in use before the end of 1959.

5. San Diego, Lindbergh Field

Future work: Money-raising problems, local politics and conflicts with adjacent military installations are holding up terminal relocation, loading stations, baggage areas and automobile parking areas.

Current work: None

Commercial jets aren't coming until runways are lengthened.

6. Phoenix, Sky Harbor Municipal

Future work: Scheduled next summer as part of $4.8 million program: 80,000 sq ft of terminal facilities; high-speed turnoffs; widening of taxiways; increasing both plane and vehicular parking areas; 14 new loading positions for jets.

Jets coming, but American and TWA have not yet said when. Field is adequate now.

7. Tucson Municipal

Future work: Scheduled by 1961 as part of a $3.5-$4 million program: New terminal facilities with insulation, soundproofing and air conditioning.

Current work: $1 million is being spent to improve runways, taxiways and loading positions.

Jets coming, but not yet scheduled. Field has handled big military jets.

8. Albuquerque, Municipal

Future work: A 10,000-ft main instrument runway must be extended or relocated, but awaits outcome of negotiations with Air Force, which owns all runways and taxiways.

Jets coming in 1960 via TWA. Big military jets have used field for years.

9. Stapleton Air Field, Denver

Future work: Expenditures of from $5 to $30 million are in the talking stage. All but one runway will be lengthened and strengthened.

Current work: None, because of a long standing—but just settled—land dispute between Army and Air Force.

Jets are expected when field is ready.

10. Dallas, Love Field

Future work: Extension of 7,500-ft runway to 8,500 ft; a new 8,500-ft instrument runway; soundproofing of terminal building.

Current work: Limited to modification of hydrant fuel system. This $12 million field is new—opened last January.

Jets coming in April or May via American; Braniff in late 1959 or early 1960. Field is ready now.

11. San Antonio, Int'l

Future work: Scheduled as part of $6 million plan: Extending a 7,500 ft runway to 9,300 ft; blast fences; resurfacing concrete runways with asphalt.

Current work: Two runways being rebuilt to 28-in. thick pavement for 64,000-lb wheel loading.

Jets coming late next year, although field will be ready in midyear.

12. Houston, Int'l

Future work: $3.5 million available for remodeling terminal building, construction

Runways must be smooth at all times; high frequency lights are needed at night.

Some existing runways will have to be repaved. Almost all will need better lighting.

• It's noisy and has a powerful blast. For passenger protection and comfort, blast fences must be erected adjacent to loading area, terminal buildings must be insulated, soundproofed and cooled.

• It costs $4 million to $6 million; has a service life of seven years and depreciates at the rate of $2,250 to $2,800 per day. It can provide revenue of about $25,000 per day (12 hours of productivity).

The economics of jet transportation makes speed essential in all ground operations. Every hour lost can cost $2,000 in revenue, $100 in depreciation, plus maintenance. Airports must have facilities to pump at least 1,250 gpm to load the 17,000 to 20,000 gal tanks. They must have sufficient control and runway facilities for fast takeoffs and landings. They must have passenger terminal and cargo facilities for fast processing and loading of 130 to 160 passengers and over 200 pieces of baggage.

No U.S. airport can now do all this on a volume basis. But at least 27 of them will be able to within the next four years. To find out what they're doing, see below.

27 Major Airports Stand in Jet Preparations

of 550 x 50-ft cargo building. $1.7 million to be spent in early 1959 for lengthening four runways to 7,600 ft and widening taxiways 50 ft with 25-ft asphalt strip on each side.

Jets coming in October, 1959 via Delta. Eastern, National, Continental, American, Braniff and Pan American to follow.

13. Minneapolis Wold Chamberlain Int'l

Future work: $29 million will be added to $11 million already spent. Scheduled: $18 million overhaul base for Northwest Airlines; $8.5 million terminal; a 9,600-ft runway; lengthening a 6,500-ft runway to 9,000 ft.

Current work: Demolition and reconstruction of runways; demolition of structures at runway ends; parking lot layout.

Jets coming by March 1960 via Northwest; Capital later. Field is ready now.

14. Kansas City, Mo., Mid-Continent Int'l

Future work: $12 million yet to be spent at this new field. Scheduled: An 8,000-ft runway; two high-speed turnoffs, new terminal building, cargo handling facilities.

Current work: Widening, lengthening runways, taxiways, plane parking areas.

Jets coming about mid 1961 via TWA.

15. St. Louis, Lambert Field

Future work: Scheduled in $10 million plan: Lengthening 6,000-ft runway to 8,000 ft, new runways and taxiways; high-speed turnoff.

Current work: $1 million expansion of terminal facilities and loading docks.

Jets coming possibly next June via American. Field is ready now.

16. New Orleans, Moisant Int'l

Future work: Scheduled in a $17 million plan: High-speed turnoffs; $2.8 million runway and taxiway extension; warm-up pads and parking aprons; vehicular parking area.

Current work: $5 million terminal building; firehouse; runway extensions.

Jets coming in early 1960 via Delta.

17. Milwaukee, General Mitchell Field

Future work: A $1.8 million extension of runway and taxiways from 8,450 ft to 9,920 ft to be started next year; later, extension of second runway, construction of high-speed turnoffs.

Current work: $1 million extension of runway from 6,730 ft to 8,450 ft; widening and lengthening taxiways.

Jets coming late 1959 or early 1960. Will also be bad weather alternate for Chicago and Detroit.

18. Chicago, O'Hare Int'l

Future work: Scheduled in a $120 million plan starting next year: New hangars, runways, taxiways and warm-up pad. Other items: Paving and elevating roadways; fuel facilities; terminal buildings and concourses; water, sewerage, heating and air-conditioning.

Current work: Runway extension from 8,000 to 8,838 ft.

Jets coming early next year via American, Pan American later.

19. Detroit, Metropolitan-Wayne County

Future work: This $25 million installation holds highest CAA classification, but plans call for $25 million in improvements. Big item is runway extensions to 10,500 ft.

Current work: 2,600-ft taxiway extension.

Jets coming via American in February; British-American, Pan American and perhaps Delta to follow.

20. Port Columbus

Future work: Two runway extensions.

Current work: Lengthening of one runway to 10,700 ft, including grading and lighting, is nearly done.

Jets coming by 1960. Meantime, field will be bad-weather alternate for other midwest jet airports. Piedmont starts turbojet operations next month.

21. Atlanta Municipal

Future work: A $17 million enlargement starts next month. Scheduled: New terminal building; jet overhaul base for Delta.

Jets coming in June via Delta.

22. Miami Int'l

Future work: Widening of taxiways in 1959; extension of main runway from within 18 months.

Current work: $26 million terminal; 3,000 gpm fueling ssytem; six-finger loading dock with 74 plane positions.

Jets coming next week via National; Eastern follows in late 1959; others later.

23. Washington, Int'l

Future work: About $100 million will be spent constructing this 3,000-acre airport designed for jets. $60 million-worth of work already planned includes all facilities and installations needed for jets.

Current work: Clearing and grading for first runway.

Jets coming in late 1960 or early 1961. Field will supplant National Airport.

24. Baltimore, Friendship Airport

Future work: 225 acres of land has been condemned for 10,000-ft runway. Runway, other improvements will cost $10 million.

Jets can be handled now, field will soon start serving Washington area.

25. Philadelphia Int'l

Future work: Scheduled in $15 million program to start early next year: 10,500-ft runway; terminal expansion; new hangar; utilities, roads and parking areas.

Current work: Nearly completed is $1.5 million extension to 9,500 ft of existing runway and taxiway.

Jets coming via American early next year: Pan American to follow. Field will be ready in two weeks.

26. N. Y. Int'l

Future work: $1.45 million facility for storage and distribution of fuel.

Current work: Construction of a $12 million instrument runway, lengthening of two runways from 8,200 ft and 9,500 ft to 10,000 ft and 11,000 ft. Also $97 million in terminal, $33 million in hangars.

Jet status: BOAC and Pan American are in with trans-Atlantic flights American starts next month.

27. Boston, Logan Int'l

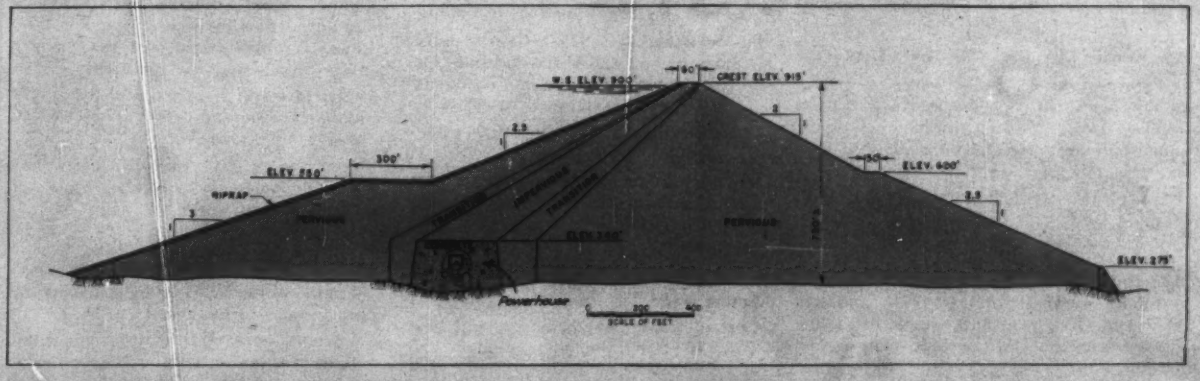
Future work: Scheduled in a $23 million expansion program: Second floor for main terminal building; extension of 8,000-ft runway to 10,000 ft; a new runway. Airlines also have plans: Northeast, a $3 million freight terminal; Eastern, a $3.5 million terminal; TWA, $3.5 million terminal.

Current work: Four hangars, a freight terminal and a 130-room motel.

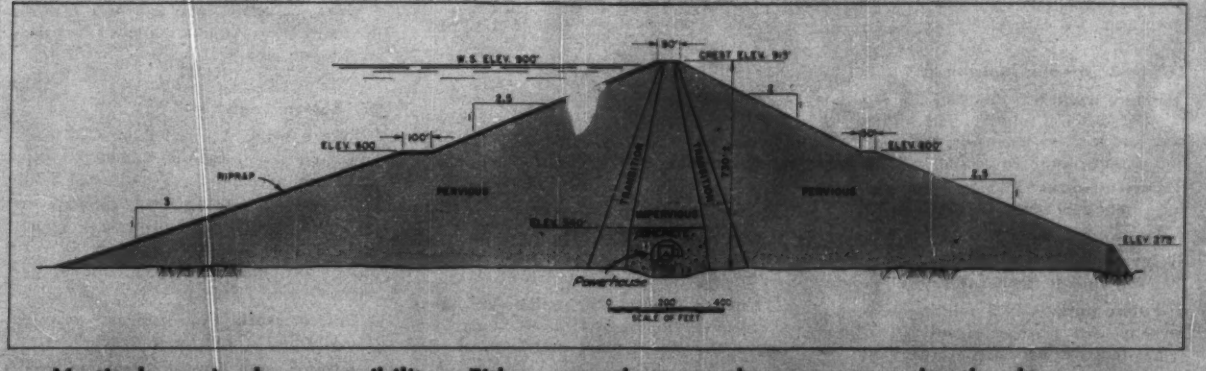
Jets are here now, but volume awaits completion of planned or started work.

California Dam Will Be Highest

Earthfill for Oroville won out over several other types mainly because of economy.



The most likely cross section will incorporate a sloping impervious core, but . . .



. . . Vertical core is also a possibility. Either way, the powerhouse goes under the dam.

Earthfill—730 Feet

The height record for earthfill dams will be upped nearly 200 ft as a result of a decision just reached by California's Water Resources Department.

The agency settled on earthfill 730 ft high for Oroville Dam, key feature of the state's $1.6 billion Feather River Project (ENR Mar. 10, 1955, p. 21). A concrete plug 155 ft high will underlie the dam's impervious core. It will contain the powerhouse.

Highest earth dam completed to date is Pacific Power & Light Co.'s newly finished Swift Dam. It's 512 ft high, on the Lewis River near Cougar, Wash. Trinity Dam, a Bureau of Reclamation earth and rockfill structure being built on the Trinity River near Lewiston, Calif., will be 537 ft high (ENR Oct. 16, p. 30).

Oroville Dam will also write another entry in the record book. It will top Hoover Dam's 726 ft to become the highest dam of any kind in the U. S. And its 79 million cu yd of material will make it one of the biggest rolled-earth embankments. However, the Corps of Engineers' Oahe Dam (ENR Aug. 14, p. 21) is number one in this respect, with 91 million cu yd.

The California body picked the Oroville design after receiving a report by a five-man consulting board. Department engineers are now working on detailed designs.

First contracts for construction of the dam proper can be awarded about January 1, 1961, if the California legislature settles the water-rights and financial questions that have been delaying the project.

Failure of the legislature to appropriate construction funds during the 1958 session has delayed the project a year. Bottleneck is construction of the west branch bridge, a double-decked combination highway and railroad bridge in the reservoir area.

Other relocation work is already under way with money provided by earlier legislative sessions (ENR Oct. 9, p. 38).

Oroville Dam will have a 5,000-ft crest spanning a gently sloping valley. A gorge formed by the river in the middle of the valley will be plugged by the concrete section, totaling 1 million cu yd. Earth fill will be placed on top of the concrete. Thus, the effective height of the earthfill through the impervious core is only 575 ft. Even so, it will still be the highest earth dam in existence.

• **Why earthfill?**—Cost of the Oroville part of the Feather River Project is now estimated at $445 million. This compares with $525 million estimated for a concrete gravity dam in a report released in 1955. The new figure includes $45 million for downstream features, chiefly an after bay reservoir; $140 million for right-of-way purchase and relocation work; and $260 million for the dam and powerhouse, including six generators. All these costs include engineering and contingency funds.

The earthfill dam was favored over four concrete dam types because it was cheaper. Its greater safety also weighed heavily in its favor.

The concrete gravity alternate was way off on cost. Closer cost-wise were the other alternates—slab-and-buttress, multiple-arch, and combination arch-and-buttress. But they were ruled out largely because of uncertainty of the effect of possible differential settlement on the side slopes.

The report was based on many test programs, including borings and drifts in the reservoir area. And some of the concrete designs were tested structurally.

The powerhouse will be located in the concrete plug in the heart of the dam. It will be completely covered by the earthfill. Diversion tunnels drilled for construction of the dam will serve as tailrace tunnels for the powerhouse.

Initial installation will be 600,000 kw. But room will be available in the powerhouse for doubling this capacity. Such additional capacity might be economically feasible 20 years in the future. Studies are being made to have two of the six generators reversible for pumped-storage purposes.

Tentative design of the dam calls for relatively flat slopes—2 to 1 and 2½ to 1 downstream, 2½ to 1 and 3 to 1 unstream. This provides an additional factor of safety but was believed necessary in making the cost comparisons.

Material will come from deposits about 10 miles downstream from the damsite. Cost estimates were based on rail haul. But, of course, there is a possibility that the low bidder will adopt truck or belt haul.

The shell of the dam will be a graded gravel fill. The material will come from huge gold-dredge tailing deposits. These gravel banks will be almost perfectly graded—the shell will include material from No. 10 mesh to 6 in. Suitable material for the core—probably a sloping type—is available near the gravel deposits.

Harvey O. Banks is director of California's Department of Water Resources. The consulting board included Raymond A. Hill of Los Angeles, John J. Hammond of Denver, Byram W. Steele of Coral Gables, Fla., B. E. Torpen of Portland, Ore., and Roger Rhoades of San Francisco.

FEATHER RIVER PROJECT will channel water from moist north to dry south.

High Court Rules U.S. Can Condemn Indian Land

The U.S. Supreme Court has given federal agencies a green light on forcing Indians to sell reservation land for public works.

The court ruled the Corps of Engineers could condemn Seneca land for a reservoir near Kinzua, Pa. The ruling defeats Seneca efforts to prevent flooding of two-thirds of their 30,000-acre reservation by the Corps' Allegheny River Dam.

Meanwhile, the Tuscaroras—another embattled tribe of the historic Six Nations Iroquois confederacy—were struggling before the Federal Power Commission to save their reservation near Lewiston, N. Y. The New York State Power Authority wants to acquire 1,400 acres of Tuscarora land for the Niagara Power Project (ENR Nov. 27, p. 83).

Since the Power Authority is a state rather than a federal agency, the Court's Seneca opinion apparently won't apply in the Tuscarora dispute. The FPC is expected to make a decision in the case this month.

The Supreme Court noted in the Seneca decision that the loss of land would be an infringement of the Indians' rights. However, ruled the jurists, Congress was fully aware of the situation when it approved the reservoir. The government may condemn lands on Indian reservations on the same basis it condemns any other land, the court said.

The Bomarc missile:

Its launching area has 56 launchers (1), two compressor buildings (2). Support facilities are powerhouse (3), assembly and test shops (4) and fuel storage buildings (5).

Under Way: 14 Bomarc Bases

Fourteen bases for launching the Air Force's Bomarc missile are under construction at strategic locations in the United States.

Details of one of the bases were disclosed last week by Turnbull Inc., Cleveland, the designers, and Corps of Engineers officers of the New York District, who are supervising construction of this particular base.

The Bomarc is a pilotless airplane that seeks out and destroys enemy planes or missiles. It has a range of 250 miles.

A product of the Boeing Airplane Co., the Bomarc is 47 ft long and has an 18-ft wing span. Its fuselage is a tapering cylinder with a maximum diameter of 35 in.

Launched vertically by the blast of a liquid fueled rocket engine, it climbs to supersonic speed. Then two ramjet engines take over the propulsion. A new model now under development will use solid fuels and boost the range to 400 miles.

The Bomarc base, which was opened for inspection last week, is located on a 300-acre plot, 85 miles from New York City and adjacent to Suffolk County Air Force Base on Long Island. The base will cost about $13 million. Paul Tishman, Inc., New York City, is the general contractor.

The base is divided into two areas—for missile launching and for missile support.

Principal units for missile support consist of a 4,000 kw diesel-electric power plant, a missile receiving, assembly and test shop, and two buildings for storing solid and liquid fuels and acid. (The acid is stored in tanks of 1-in.-thick aluminum.) Included as part of the power plant is a refrigeration plant, a high temperature water heating plant and a nitrogen generating plant. Both hot and cold water are needed at the missile launchers while nitrogen is required to blanket the fuels in their storage tanks and in the trucks that transport them to the missiles.

In the launching area at Suffolk, 56 launchers are being constructed, and there is provision to double this number. Basically the launcher is an elevator to raise the missile from its horizontal stored position to the vertical launching position. Each is installed in a shelter building. This consists of a reinforced concrete box 18 ft wide and 65 ft long topped by a steel roof. The roof is split down the middle so the halves can be rolled to either side out of the way when the missile is launched. The roof opens and the missile is raised in a single hydraulic operation initiated from a control building located about three miles away (ENR July 3, p. 24).

These launcher shelters are maintained at a temperature of 60 to 90 deg and 50% relative humidity. At each side of each launcher shelter are leantos, one containing mechanical, the other electrical equipment.

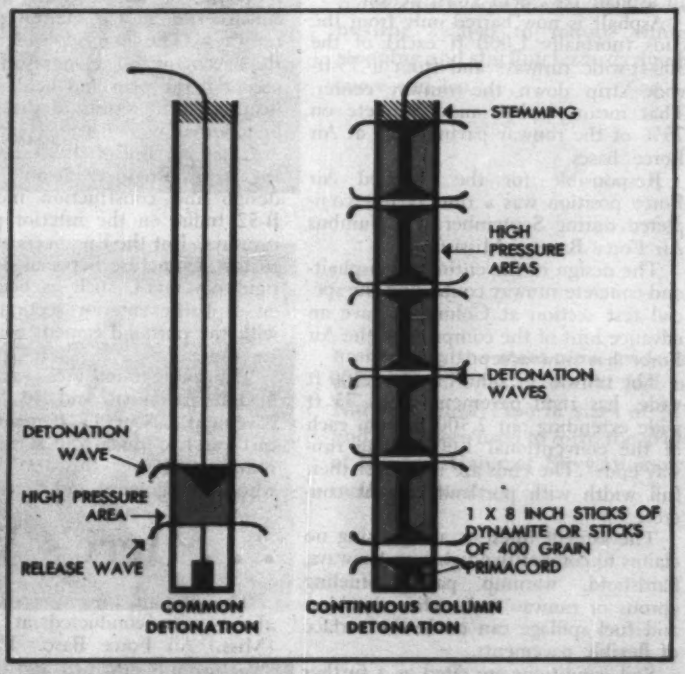
The launchers are arranged in batteries of 28, each serviced by a compressor building. These buildings provide high and low pressure helium and air to the shelters. Equipment in them also converts high temperature (400 F) water from the power plant into 220 F water to be pumped to the shelters. Chilled water (45 F) is also brought to these buildings from the refrigeration plant for later distribution to the launchers.

All piping (18 miles) and electrical conduit (9 miles) are placed underground.

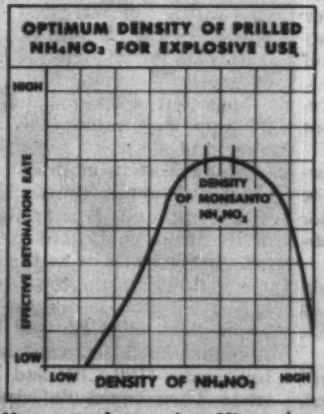
Bomarcs are being installed at these Air Force Bases: Suffolk, Westhampton, L. I.; Dow, Bangor, Me.; Otis, Falmouth, Mass.; Ethan Allen, Winooski, Vt.; Niagara Falls, N. Y.; McGuire, Trenton, N. J.; Langley, Hampton, Va.; Truax, Madison, Wis.; Municipal Airport, Duluth, Minn.; Paine, Everett, Wash.; Camp Adair, Albany, Ore.; Kinross, Sault Ste. Marie, Mich.; Travis, Sacramento, Calif.; Cooke, Lompoc, Calif.

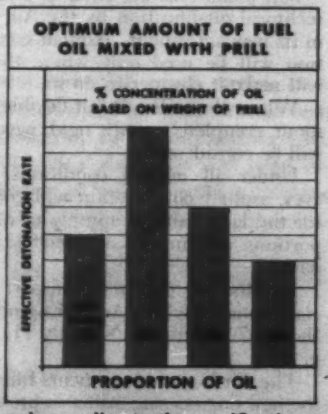
PRILLED AMMONIUM NITRATE IN CONTINUOUS COLUMN DETONATION GIVES BETTER BREAKAGE, SAVES DRILLING AND CRUSHING COSTS!

Continuous column detonation (right) gives better shatter because entire hole detonates approximately at speed of Primacord* (20,000 to 21,000 ft/sec.). Notice no release wave structure . . . entire hole works. Faster detonation cuts heat loss. Contained heat results in gas expansion—produces more work for less money. For the most favorable results, make sure hole is filled with NH_4NO_3 but don't risk destroying the best prill-pack by tamping. Pour oil in bag of Ammonium Nitrate. Let set for at least ½ hour before loading, or use mechanical mixer. Monsanto Ammonium Nitrate gives you optimum density of prilled NH_4NO_3 for explosive use *and* optimum prill size.



Ideal rock breakage, like this, reduces crushing costs. The Monsanto method of detonation, in conjunction with a new, top-quality prilled NH_4NO_3 that Monsanto research developed, will yield the equivalent of 60 % gelatin dynamite at ¼ the cost.

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Asphalt Runways Coming Back

Air Force has eased its ban as a result of a new report and current house hearings on pavement tests

Asphalt will land again on Air Force jet-bomber runways.

Air Force officials this week told the House Armed Services Investigating Subcommittee that asphaltic concrete may now compete for the larger part of runway paving work.

The Air Force in 1956 had banned all asphalt pavement construction.

Asphalt is now barred only from the ends (normally 1,000 ft each) of the 300-ft-wide runways and from a 75-ft-wide strip down the runway center. That means asphalt may compete on 75% of the runway paving work at Air Force bases.

Responsible for the changed Air Force position was a runway test completed during September at Columbus Air Force Base in Mississippi.

The design of the entire new asphalt-and-concrete runway containing the special test section at Columbus gave an advance hint of the compromise the Air Force has now accepted.

The runway, 12,000 ft long by 300 ft wide, has rigid pavement strips 75 ft wide extending out 2,500 ft from each of the conventional 1,000-ft-long runway ends. The ends are paved for their full width with portland cement concrete.

The asphalt interests are pressing no claims to competitive rights on taxiways, hardstand, warmup pads, refueling aprons or runway ends—where jet blast and fuel spillage can erode the surface of flexible pavements.

Soil conditions are cited as a further technical qualification by the Air Force in its new agreement. Asphalt construction will be used only where the soil will make it cheaper to do so.

Where the soils rule out flexible pavement completely, only rigid pavement will be considered.

Under all normal conditions, however, asphalt construction will compete for the large outside apron and interior portions of runways as specified alternate.

Results of the test support bold claims made by the Army Engineers at the 1957 hearings (ENR July 11, 1957, p. 26).

The Air Force now concurs fully with the new engineering evidence presented.

The Air Force—in defense of its own ban against flexible pavement—had told the subcommittee that no asphalt runway could take the channelized traffic and high tire pressures of heavy bombers like the B-47 and B-52. But Walter K. Wilson, Jr., Deputy Chief of Engineers for construction, said the Corps could design and build an asphalt pavement that would meet every requirement of heavy bomber use.

To settle the argument, subcommittee chairman F. Edward Hebert (D., La.) ordered the Air Force and the Army Engineers to come up with some proposal for reinstatement of asphalt construction in the central portion of runways. The two services agreed on the pavement test. Congressman Hebert accepted the plan and held off further hearings until results of the test could be reported.

Chief purpose of the test was checking Army Engineer flexible pavement design and construction methods for B-52 traffic on the interior portion of runways. But the Engineers also wanted to test a juncture between flexible and rigid pavement, such as occurs where an asphaltic interior section connects with the portland cement concrete of a runway end.

The traffic-tested area was 250 ft of flexible pavement and 50 ft of rigid pavement, about 15 ft wide. A load cart on two dual wheels made 5,000 round trips over this test lane. The wheel arrangement and tires duplicated the gear assembly of a B-52 bomber. The 212,000-lb load on the cart represented the 265,000-lb aft gear, reduced by 20% as partial compensation for the wing lift that occurs on a runway. Tires were inflated to full 266 psi pressure for a 510,000-lb plane.

Both types of pavement went through 10,000 load repetitions without failure or sign of critical distress. Settlement occurred on both sections and was much more pronounced for the flexible pavement, but this settling was so uniform it had little or no adverse effect on surface smoothness.

Surface smoothness of the asphalt section proved out pretty well at the end of the test, the report indicates. Variations exceeding tolerance limits occurred near the outer edges of the test lane because of uneven traffic distribution and construction joints in the pavement at these locations. But the main body of the asphalt pavement showed up at the end with surface smoothness still meeting the specified tolerances ($\frac{1}{4}$ in. in 12 ft in the longitudinal direction; $\frac{1}{8}$ in. in 12 ft in the transverse direction).

Findings presented in the report make it obvious that some of the deviations and weaknesses developed during the test are the result of the testing procedure, while others can be corrected by design or construction changes.

. . . Here's What They Tested

The asphalt runway tests discussed above were conducted at Columbus (Miss.) Air Force Base. The runway structure was designed and constructed on the basis of the latest criteria developed by the Flexible Pavement Laboratory at the Waterways Experiment Station in Vicksburg, Miss.

Some 5 ft of selected and compacted fill supports a flexible pavement structure 38 in. deep.

At the bottom of this structure is a clay-gravel subbase course, 13 in. thick, with a California Bearing Ratio (CBR) of 20. It was compacted to 95% modified AASHO density in the lower 6 in. and to 100% in the top 7 in.

Above it are a second subbase course 10 in. thick (40 CBR and 100% density) and an 11-in. crushed aggregate base course (100 CBR and 100% density). Then comes the asphaltic concrete.

Relatively lean, densely graded mixes were used for the 2½-in. binder course and the 1½-in. wearing course of the asphaltic surface. Asphalt content in the test section was 3.5% for the binder course and 4.3% for the top course. Five gradations of aggregates consisted of 1-in. crushed limestone (used only in the binder mix), ¾-in. crushed chert gravel, ½-in. limestone screenings, coarse washed sand and fine bank sand.

Some observers had expressed fear that the lean-mix asphaltic concrete would crack unless kneaded frequently by traffic. Cracking occurred in both the flexible asphalt and rigid portland cement pavements during the test. But most of the cracks were minor and of a type that could be expected or discounted.

Somewhat surprisingly, the rigid pavement developed one severe crack after some 2,000 load applications. This crack, 6 ft outside the traffic lane, ran parallel to it for 35 ft and later cut across to the traffic lane and through a longitudinal construction joint inside the lane.

The rigid pavement consists of 18-in. concrete slab resting on 20 in. (compacted) of clay-gravel with a specified CBR of 20, compacted to 100% density in the top 14 in. and 95% below that.

USS National Pipe used exclusively for snow-melting system on Chicago's Calumet Skyway

Welding together National Steel Pipe sections at the 22-lane toll plaza area, Calumet Skyway, Chicago. The plaza area is equipped with a snow-melting system to reduce winter stopping and starting hazards due to snow and ice.

Embedding the steel pipe grids in concrete. A total of 76,192 feet of National Steel Pipe in sizes of ¾" and 1¼" were used to form the grids of the vast Calumet Skyway snow-melting system.

Under the toll plaza areas, too, boilers supply the heat, through heat exchangers, to the circulating anti-freeze. National Pipe was used exclusively on this application utilizing 2,211 feet of USS National Seamless Steel Pipe.

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Rugged ASPHALT paving saves

Washington $30,000 a mile

...Saves State $381,000 in first cost on 12.7 miles of Interstate Highway. Maintenance savings expected, too!

For the Prairie Creek to Tumwater section of U. S. Highway 99, the State of Washington chose modern Asphalt pavement.

By so doing it saved thousands of dollars in initial costs alone. The entire paving cost for 12.7 miles was $826,978 . . . with savings of $30,000 a mile compared with a connecting slab-paved section. *And more savings are to come . . . for Washington's records indicate that Asphalt pavements cost less to maintain.*

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Rugged . . . because layer-upon-layer construction "locks" surface to the foundation, builds up strength and resilience.

Safe . . . because modern Asphalt pavement is traction-textured for high skid-resistance. There is less glare . . . greater traffic-line visibility.

In winter, snow melts faster and Asphalt pavement is not harmed by de-icing chemicals.

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Modern Asphalt construction is a triumph of road-building science. Built-up layers spread the load . . . absorb shock and pounding. Economy, safety and comfort are built-in to last.

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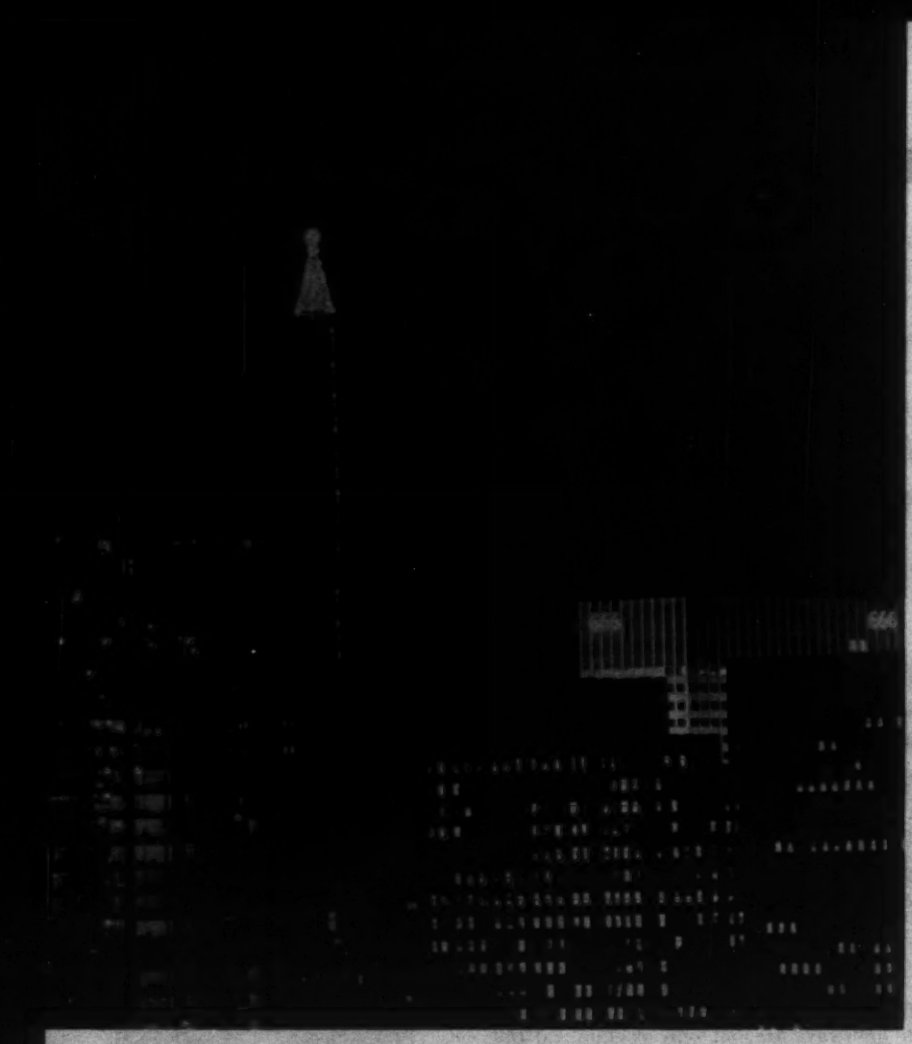

Christmas Tree Tops Out Tall Tower

New York City construction men gave Santa Claus a landmark last week.

Steel crews hoisted a Christmas tree 587 ft to the roof of the new Time & Life Building when the frame was topped out.

Steel erection began in April. Since then 31,000 tons of steel have gone into the frame of the $70 million, 47-story skyscraper. The building is across the street from Rockefeller Center.

Harrison & Abramovitz & Harris are the architects; George A. Fuller Co., and John Lowry, Inc. are the general contractors. All are in New York City.

Bethlehem Steel Co. is the steel contractor. Completion is scheduled for late 1959.

Skyscraper Gets Glass Tile Wall

A new 15-story headquarters for Atlantic Coastline Railroad Co. in Jacksonville, Fla., will be sheathed in Venetian glass tile.

Construction began last month on the $10 million skyscraper. Completion is scheduled for the middle of 1960.

A structural steel frame will carry cellular steel decking covered with lightweight concrete fill to form the floors.

On the outside, sandwich walls will consist of two layers of concrete with steel-jacketed glass-fiber insulation between a facing of small Venetian glass tiles patterned in yellow and blue.

The architects plan careful manufacturing of the panels with a numbering sequence to insure the proper pattern on the completed building. The panels measure 8 x 9 ft and weigh 2,200 lb. They will be bolted to the building frame.

The architects spent two years looking for an unusual combination of materials that would withstand wind pressure, flying debris during hurricanes and alternate freezing and thawing. Several test panels were put through wind-tunnel tests, frozen, bent and stretched.

Kemp, Bunch & Jackson are the architects for the project. Daniel Construction Co. is the general contractor.

Pereira and Luckman Part Company; Form New Firms

The firm of Pereira & Luckman, architects, planners and engineers, is dissolved. Succeeding it will be Charles Luckman Associates.

William L. Pereira sold his stock and interest in the California corporation and its New York and California partnerships to Mr. Luckman.

Mr. Luckman will be president of the new firm. Present staff and offices in Los Angeles and New York will be retained. His firm also will assume responsibility for all existing contracts.

Mr. Pereira will establish his own planning and architectural practice in Los Angeles under the name of William L. Pereira and Associates.

As Pereira & Luckman, the firm designed projects having a construction value topping $1 billion. Jobs included master planning for Cape Canaveral and Patrick Air Force Base in Florida.

Skyscrapers Will Team Up To Increase Floor Areas

Downtown Dallas, Tex., will get a 30-story 600,000-sq-ft office building that will be connected with an adjoining office building.

The new skyscraper will be a welded steel structure with an exterior of brick, glass and tile. The building is designed so its floors can be joined with matching floors in the adjacent Fidelity Union Life Building.

This connection provides 34,000 sq ft for tenants requiring more space on one floor than either building provides alone.

An 800-car parking facility will be provided for the new building by expansion of the Fidelity Union Garage. The garages will be connected by a hall and walkthrough.

Cost of the building was not revealed. Hedrick & Stanley are the architects; Inge & Hayman, Inc., is the general contractor; Mayflower Investment Co. is the builder. All are Dallas firms.

Standards Group Plans Safety Code Revision

The American Standards Association has recommended that the Safety Code for Building Construction (A10.2–1944) be broadened to cover all phases of construction. This would include heavy construction, highways as well as building construction.

Engineers and builders forming the Sectional Committee on Safety of the ASA made the recommendation.

The committee's objective is to develop a workable and enforceable code that can be adopted by safety authorities in all states of the country.

New Gateway to the West—This 8-lane bridge at Pittsburgh's Point was designed by Richardson-Gordon and Associates, Pittsburgh, Pa. It combines a steel arch with Tiger Brand Wire Rope suspenders.

Up she goes! The last link in Pittsburgh's Pitt Parkway

—and the wire rope is USS Tiger Brand, of course!

USS Tiger Brand Wire Rope was used on all the cranes that did the heavy lifting.

The new double-deck Fort Pitt Bridge spans the Monongahela River and connects the Golden Triangle with a double-deck tunnel under Mt. Washington. This eliminates a serious traffic bottleneck—permits Lincoln and William Penn highway traffic to cross Pittsburgh in half an hour without stopping for traffic lights.

The new bridge is unique in design. It is a double-deck, tied-arch span 752 feet long. Two 4-lane roadways are supported by 112 prestressed USS Tiger Brand suspender ropes, each 3¼ inches in diameter. A total of 8960 feet of suspender rope was used in the bridge.

The construction cranes were all rigged with USS Tiger Brand Wire Rope, mostly one inch in diameter. The heaviest lifts were the corner posts which weighed 118 tons each.

The building of the Fort Pitt Bridge represents the combined efforts of various divisions of United States Steel. Approximately 16,000 tons of steel were rolled for the bridge and its approaches. American Bridge did the fabricating and erecting, and the wire rope and suspender cables were supplied by American Steel & Wire, 614 Superior Ave., N.W., Cleveland 13, O.

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United States Steel Export Company, Distributors Abroad

Arch truss is tied back to erection tower by cables.

Last arch member is lowered into

Spanning

A spectacular steel arch bridge across the Colorado River gorge at Glen Canyon Dam is rapidly nearing completion.

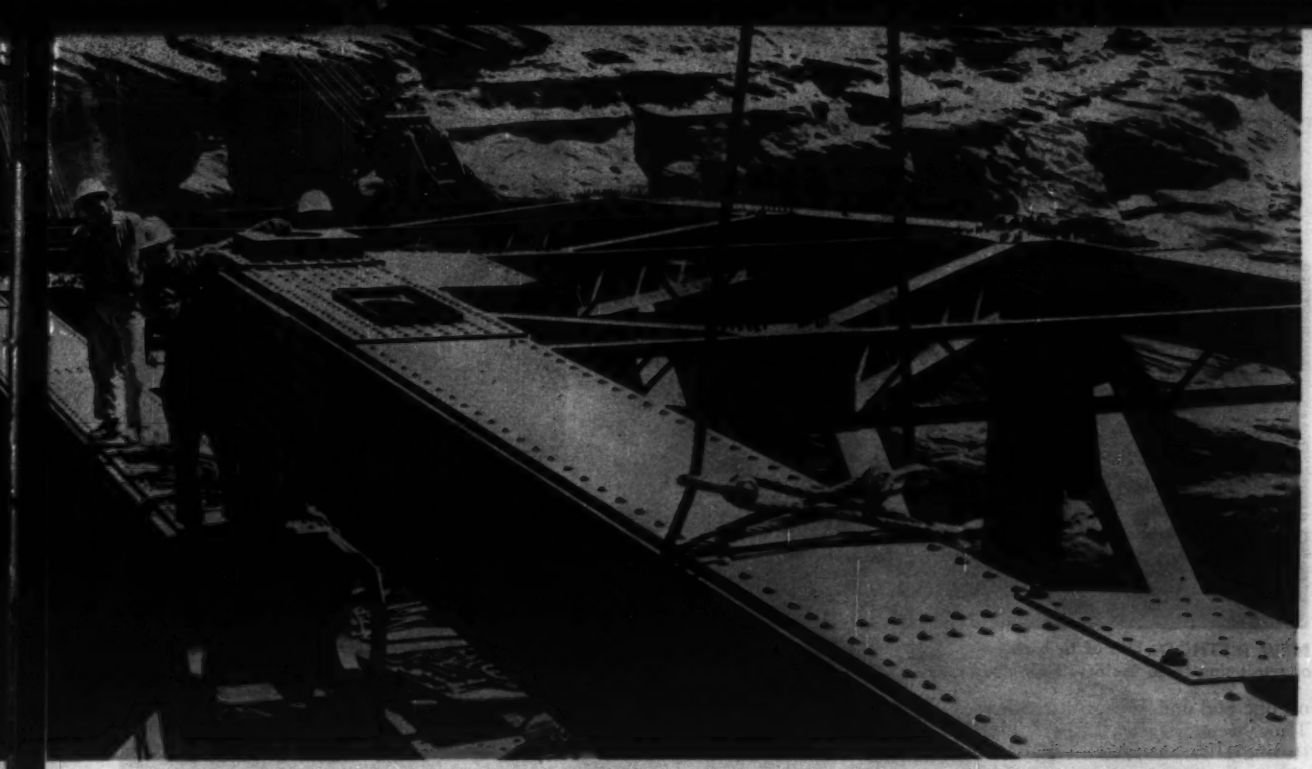
Span is 1,028 ft—second only to New York's Kill Van Kull Bridge, the longest steel arch in the U.S. And the bridge's deck towers 700 ft above the canyon floor making it the highest major steel arch bridge (see p. 38).

The bridge will be part of a primary highway system providing access to Glen Canyon Dam. Its completion will simplify construction operations on the dam. Present access across the canyon is either by cableway or footbridge.

Erection procedure followed carefully planned sequences and proceeded without incident. Each side of the partly completed arch was held in position during erection by tie-back cables as material was fed to the work by cableway.

Early studies considered both suspension bridge and steel arch designs. Little difference was found in the cost. The arch design was adopted primarily because it provided greater flexibility in arrangement of the road approaches. Suspension bridge approach spans would have interfered with access to proposed vista areas for viewing construction of the dam.

Designers also considered several different types of arches. A fixed box girder arch weighed 11% more than a two-hinged arch. And a fixed truss-type



place at mid-span. It is connected by a 20-in.-dia steel pin.

Glen Canyon at 700 Feet

arch weighed 3% more. Also considered was a design that would provide a three-hinged arch for dead load with a two-hinged arch effect for live load (H20-S16). Final design was a two-hinged, trussed arch.

• **Constructed by cableway**—First decision to be made in the erection procedure was to use cableways to service the job. Then the contractor decided to support the partially completed arches by means of tie-back cables.

In retrospect the erection method seems fairly obvious. But other possibilities had to be considered. Obviously, it would have been impossible to support the arch by falsework because of the canyon depth. And using travelers to build the arch out from each side would have meant a tie-back system double the strength of the one used.

Two cableways were installed. First one in place was a 12-ton capacity unit 30 ft from the bridge center line. This gave the contractor access back and forth across the canyon and was used for early stages of skewback construction. Later it hauled personnel and small supplies while the larger one hauled bridge members.

The main cableway, with a 1,540-ft span, had 25-ton capacity. It was erected on the center line of the bridge. The towers of this cableway are 165 ft high

At 1,028 ft, its the second longest steel arch in the U. S.

NEW METHOD. Use of tie-back cables in swinging the span and the method of tensioning them are new to bridge building. Cables tie back to towers . . .

THEN COMES TENSION. It's provided by 100-ton jacks like these on a lower chord.

on one end and 150 on the other end. They were rigged to permit luffing (tilting) the entire cableway 20 ft in either direction so that it could serve both arch trusses.

• **Skewbacks first**—First construction operation was the installation of skewbacks in the canyon walls. These are concrete thrust blocks. Mounted on them are steel shoes that hold the arch-truss-supporting, 16-in. dia steel pins.

The concrete is anchored in the sandstone cliff by 1¼-in. dia dowels grouted into the rock as much as 30 ft. Each skewback has 600 cu yd of concrete.

Rock was excavated by drilling and blasting. To prevent overbreak very small powder charges were used.

During this work a rock fall of some 5,000 cu yd resulted in redesign of one of the skewbacks. Fortunately the fall occurred at night so there were no injuries. Because of the fall and because of poorer-than-expected rock, the contractor strengthened both skewbacks.

• **Tie-back towers**—The tie-back cable system centers around a pair of towers, one, 120 ft high and the other, 100 ft high. Extra height was needed on one to permit the cables to clear the cliff.

The tie-backs were needed only until the arch was completed. Accordingly, some of the tower members were made of deck structure bridge pieces. The tower legs are deck support columns and the horizontal braces are floor beams. Diagonals and supporting struts are temporary pieces.

Each tower leg was 16 back guy lines to hold it in place during the erection process. Guy lines as well as tie-back cables are 1¼-in.-dia bridge strand. All were supplied in predetermined lengths by Bethlehem Pacific Coast Steel Corp.

• **Steel erection**—First member placed on each side was the lower chord piece. It is attached to the skewback by a 16-in.-dia pin. The other ends of these pieces are supported at the first lower chord panel points by pairs of tie-back lines.

After steel to the second panel point was erected, four tie-back lines were attached to the lower chord at these points. This permitted the first pairs of tie-back lines to be removed.

Steel erection continued for two more panels. Then four tie-back cables were attached to each of the third upper chord panel points.

Work continued in this manner with six tie-back lines attached at the fifth upper chord panel points and 10 tie-back lines attached at the ninth upper chord panel points.

After each group of tie-back cables was fastened and tightened, the preceding tie-back lines were removed. In fact, the act of tightening a new set loosened the previous lines so they became ineffective.

The final sets of tie-back lines were attached at the 15th panel points (center span is the 21st panel point) with 8 cables used at each point. These cables, however, did not have to support the full weight of the partly completed arch. In this case, the ninth panel point tie-back cables were left in place and kept under tension. The lines attached to both ninth and 15th panel points were used to make final adjustments in positioning the center span pin and swinging the span.

• **New method**—Method of tensioning the tie-back cables and their use in swinging the span is new in bridge construction. The cables are attached to a yoke. The yoke is pin-connected to check plates and shop riveted to the chord member. (Extra check plate steel was simply burned off after completion of the arch construction).

For each pair of cables, a double set of heavy steel strongbacks is inserted between the yoke and the cables. The cables are actually attached to 2¼-in.-dia high-strength steel rods. These rods are threaded for their full length and are secured in the strongbacks by nuts. Matching rods for each cable hold the strongbacks to the yoke.

To tension the tie-back cables, a 100 ton jack is inserted between the strongbacks and the steel pieces are jacked apart. Should the tension not be great enough when the jack attains full reach, the rods are anchored to one strongback by nuts. The other strongback is then moved in and the process repeated.

Gages on the jacks give thrust that can be converted to tons of tension in the cables. All cables at a single panel point are thus tensioned equally. But this is not enough. The cables are then further adjusted so all have equal sag.

When the time came to close the arch, all arch steel was in place except the final top chord piece. The mid-span bottom chord pieces were in position but were not joined.

Gap between arches had been calculated based on air and steel temperatures. Remember each arch half was supported by 36 tie-back cables—10 at each 9th upper chord panel point and 8 at each 15th upper chord panel point.

To close the gap, tension was slackened in pairs of cables by reversing the cable tensioning process. Extremely fine control was possible. A small movement of a single jack to slightly slacken one pair of cables could move the huge steel assembly minute fractions of an inch. Thus, positioning the arch halves was

TALL STORY—When completed, the "Executive House" now under construction in Chicago, will be the tallest reinforced structure in the United States. Anchored to 57 caissons firmly imbedded in 115 feet of bedrock, this ultra-modern 40-story building rose skyward at the rate of better than one story a week. The contractor, C. A. Tharnstrom & Company of Skokie, Illinois, was able to maintain this pace by working continuously, even during the rigorous winter months. Protecting workmen and materials were huge tarps made by M. Mauritzon & Company, Chicago from Mount Vernon duck.

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Major Steel Arch Bridges of the World*

	Name	Location	Span (ft.)	Clearance to Water (ft.)	Year
1.	Kill Van Kull	New York City	1,652	290	1931
2.	Sydney Harbor	Australia	1,650	360	1930
3.	Birchenough	S. Rhodesia	1,080	256	1935
4.	Glen Canyon	Arizona	1,028	645	1958
5.	Hell Gate	New York City	977½	265	1917
6.	Rainbow	Niagara Falls	950	180	1941
7.	Henry Hudson	New York City	800	145	1936
8.	Inoura Narrows	Japan	800	113	1955

*Sources: Earl and Wright, consulting engineers, San Francisco, and ENGINEERING NEWS-RECORD.

accomplished and the 20-in. center pins were inserted. This made the assembly a three-hinged self-supporting arch. And it permitted removal of tie-back lines.

Final connection of the bottom chords was important in converting the bridge to a two-hinged arch.

Jacks were mounted in each of the two mid-span bottom chord pieces. Compression was packed into the bottom chords until the proper amount was reached. Then rivet holes were drilled in the previously blank piece to make the final connection. This process is very important because characteristics of the arch depends on how much stress is in the bottom chord.

Once the arch was closed, the rest of the erection procedure was relatively simple. Column and floor beam material was delivered by the cableway and deck paving followed.

Glen Canyon Bridge: Key Facts

What—The bridge across Glen Canyon will be the second longest steel arch bridge in the U. S.—1,028 ft. New York's Kill Van Kull Bridge is 1,652 ft long.

The Glen Canyon span's deck is 700 ft above the canyon floor, making it the highest such bridge in existence.

Arch trusses are 40 ft, center-to-center. They provide a 40-ft-wide, concrete-decked roadway and two 4-ft walks. Chord members are riveted, built-up square box sections with outside dimensions 2 ft, 8¼ in.

Chord members are made of low-alloy steel with basic design stress of 24,000 psi. Because chord members are always in compression, the basic stress must be reduced to account for column action. In this case the L/r ratio is fairly low because of the relatively large box sections and relatively short panel spans. Result is little reduction in the basic stress. Consequently there is a substantial weight savings through the use of low alloy steel in place of ordinary carbon steel.

Rise from end hinge to center span is 165 ft. Trusses are 37 ft deep at the end and 22 ft deep at the crown. Columns between arch and deck are unbraced box members spaced 44 ft center-to-center at the crown and 54 ft center-to-center at the hinge. Reason for the varied spacing: as the columns get longer they must be made stronger. Greater span then becomes economical. Center columns have disk bearing (10-in. dia, spherical segment) to accommodate lateral movement. Outside columns are long enough to absorb lateral movement in bending, as anticipated. It's designed to resist a 100-mph wind.

Where—The bridge is located in Arizona just downstream from the Glen Canyon Dam, on the Colorado River near the Utah border.

Why—The bridge will be part of a primary highway system providing access to Glen Canyon Dam. Its completion will greatly simplify construction operations on the dam. Present access across the canyon is either by cableway or footbridge.

Who—The bridge was designed by the Bureau of Reclamation and is being constructed under a $4.2 million contract by Kiewit-Judson Pacific Murphy, a joint venture of Peter Kiewit Sons' Co. and Judson Pacific-Murphy Corp. It's financed jointly by the State of Arizona, the Bureau of Public Roads and the Bureau of Reclamation.

Grant Bloodgood is assistant commissioner and chief engineer of the Bureau of Reclamation at Denver. Robert Sailer is in charge of the Bureau's bridge design section. L. F. Wylie is project construction engineer for the Bureau for Glen Canyon Dam and its associated contracts.

F. J. Murphy is project manager and W. A. Choate is superintendent for the joint venture. Earl & Wright, San Francisco consulting engineers, worked with Kiewit-Judson Pacific Murphy to plan erection and design the cableways. Alpo J. Tokola was project engineer. He was assisted by Eero M. Hekkanen.

Downhill view from Iron Mountain tunnel inlet shows first two conduits and pumping station, with reservoir and aqueduct in background. Excavation at right of pumping station will house third set of pumps, and third conduit will be added.

This SMS-Rotovalve at Iron Mountain shows clearly the drop-tight shut-off position. In operation, the conical plug first lifts, then turns, finally reseats, giving you precise aperture control.

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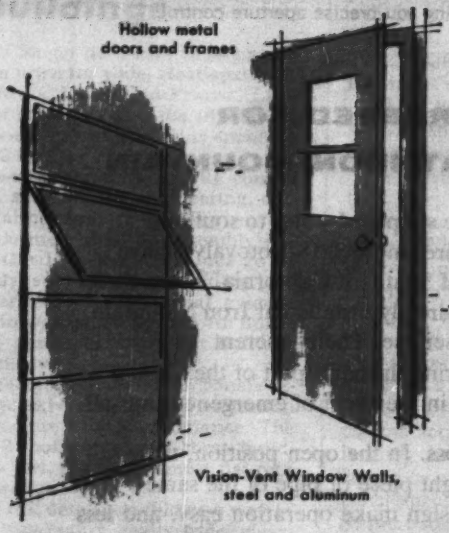

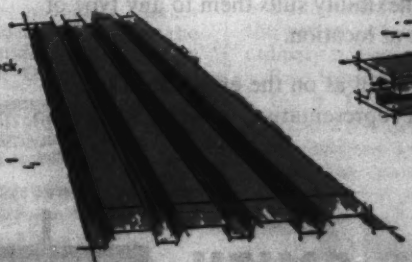

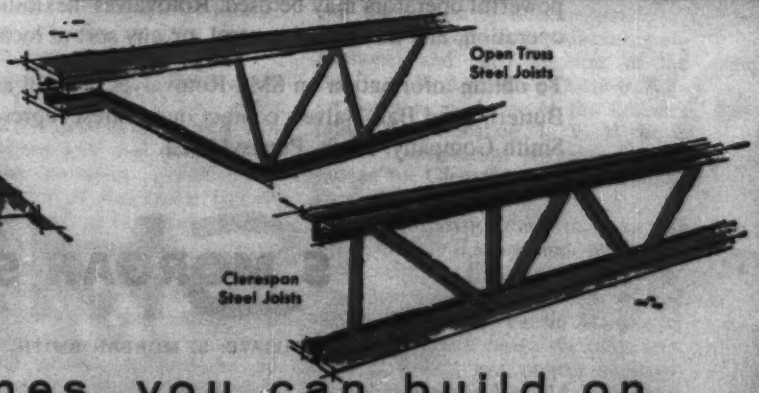

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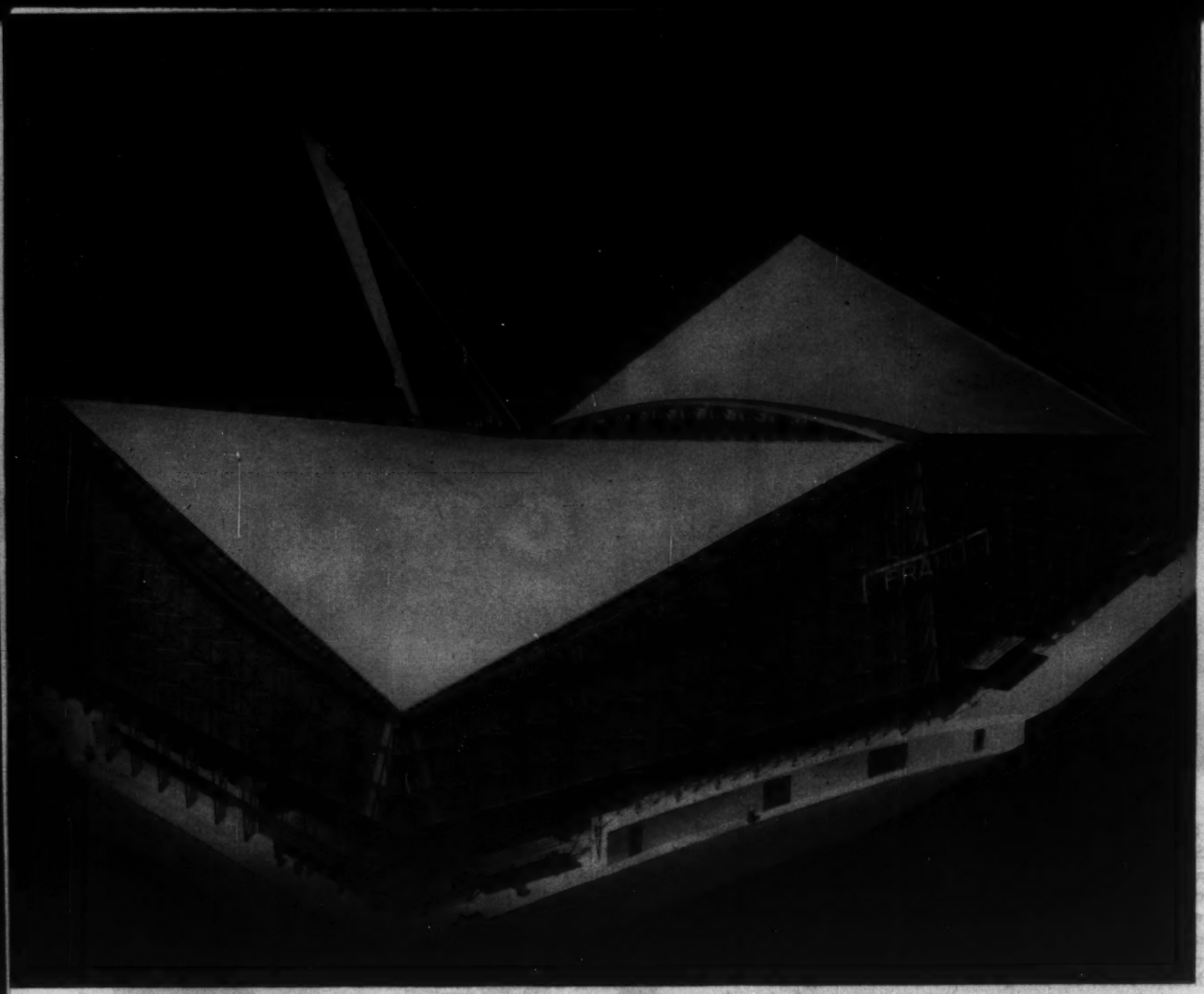


French Pavilion at the Brussels World's Fair had a long-span roof of unusual construction.

This Counterbalanced Roof

Most of the buildings at the Brussels World's Fair will soon be gone. And gone with them will be a unique structural design—the French Pavilion.

The designers of this huge exhibit building were faced with two handicaps:

- Bad soil conditions hampered their choice of foundations.
- Existing underground facilities limited their selection of support points.

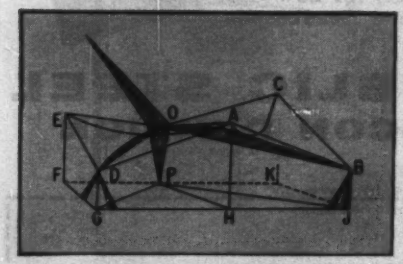
But they came up with an imaginative framing system that minimized these handicaps while permitting a much-desired, column-free exhibition space. The roof covered 130,000 sq ft without interior supports.

The building in plan consisted of two adjoining rhomboids. The roof over each was a sheet-steel hyperbolic-paraboloid with 230-ft sides. (These double-curved surfaces could be generated by moving a straight line along the sloping outer edges of the roof, starting at the center.)

Together with glass and plastic walls ranging in height from 52 to 105 ft, these warped surfaces enclosed five exhibition floors totaling 270,000 sq ft, over 9 million cu ft of space.

• Balanced design—Because of the soft clay fill on the site, the building was supported on precast concrete piles 65 ft long. Even the derricks that erected it had to be mounted on pile footings.

To keep foundation costs down, the number of supports needed to carry the heavy roof weight was reduced to a minimum. This was done by balancing the roof on one support, designed to carry about 2,000 tons—three-quarters of the total dead load. Two other supports, at low points of the roof, took the rest of the vertical loads and the wind loads.



Unique Structural System

The French Pavilion roof had three main supports, OP, DG and BJ. But it was balanced about a main pivot, O, for dead load.

An arrow-like projection cantilevered out from the roof at O. Two space trusses connected O with the roof at B and D. Acting together with the huge cantilever as levers, these diagonal trusses counterbalanced the weight of the roof.

Trussed pipe columns around the perimeter of the building at 18-ft intervals carried the weight of trusses along the edges of the roof.

Arrow-like projection served as a counterweight for the cable-suspended metal roof.

Needs No Interior Supports

The counterweight was a decorative, arrow-like cantilever that sloped upward about 200 ft from the main pivot. It housed a 300-seat auditorium at its base.

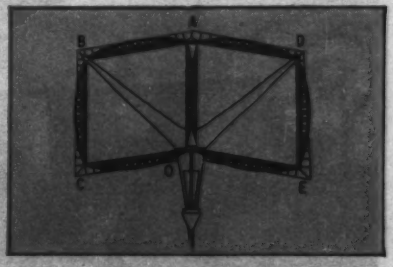
Two space trusses radiated from the main pivot to the diagonally opposite corners of the double-curved roof. These acted with the cantilever as levers in balancing the roof weight.

• **Arches and catenaries**—The two sheet-steel hyperbolic-paraboloids comprising the roof were each supported by a cable system in two perpendicular directions. Curvature of the parabolas formed by the cables laid in one direction was opposite to that of the cables in the other direction. Those concave downward carried the vertical load; the other set resisted upward wind pressures.

Support cables were composed of eight parallel steel wires 0.28 in. in diameter. Perpendicular cables were made up of six wires of the same size. All were prestressed, so that they remained taut even when exterior forces tended to compress them.

The cables were anchored to inclined steel bowstring trusses placed along the edges of the two hyperbolic-paraboloids. At the center of the building, two inclined bowstring trusses extended along the intersection of the warped surfaces; their top chords were tangent at midspan and their bottom chords were braced to each other.

The cables were run diagonally between the anchor trusses; 39 cables were attached to each truss. At each support point one main cable and one cable of the perpendicular system were anchored. Prestress was applied with turnbuckles. The amount of tension put into each cable was controlled by



Suspended Metal Roof

The French Pavilion roof consisted of two sheet-steel hyperbolic-paraboloids. This metal roofing was supported on steel cables strung in two perpendicular directions. The cables spanned between bowstring trusses placed along the edges of the two double-curved surfaces.

The trusses were hinged at their intersections above the main pivot, O, and at the diagonally opposite corners, B and D. Under cable pull, they acted in pairs, as arches, the thrust being taken by the diagonal space trusses, OD and OB.

MAIN PIVOT (before erection of the counterweight) supported the counterweight, diagonal space trusses and the bowstring trusses to which the roof cables were anchored. It carried about three-quarters of the roof load.

PEDESTRIAN BRIDGE, with exhibits, was supported on a space truss that framed diagonally between the main pivot and a corner roof support. The 298-ft truss had a triangular cross section.

COUNTERWEIGHT projected up and out over 200 ft at the front of the French Pavilion. It housed a 300-seat auditorium at its base.

measuring vibrations with acoustic indicators.

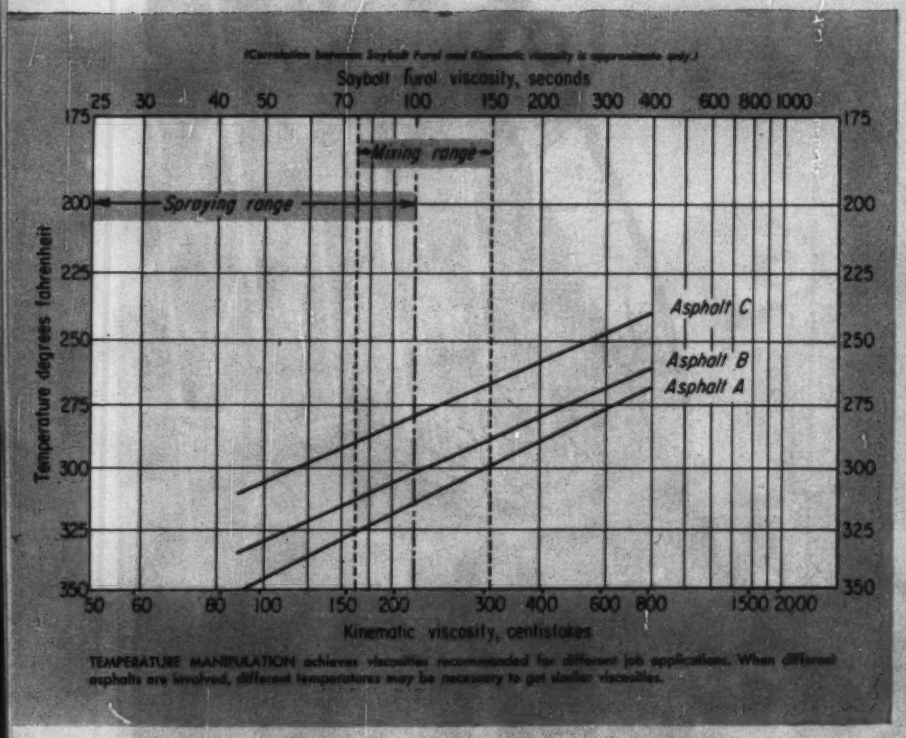
Hinged over roof supports the trusses acted in pairs as arches in resisting the cable pull. The space trusses running diagonally from the main pivot to the support corners served as ties for the structure.

The trusses were delivered to the site in sections with a maximum length of 78 ft and weighing 20 to 30 tons. These components were shop welded. They were assembled at the site with bolts. Four derricks erected each of the 230 ft trusses.

Trussed pipe columns spaced about 18 ft c-c along the outer walls carried the weight of the trusses along the edges. Under wind or snow, the wall columns were subjected to negative pressure. But the resultant of this pressure and the weight of columns and trusses always yielded a downward load on the foundations.

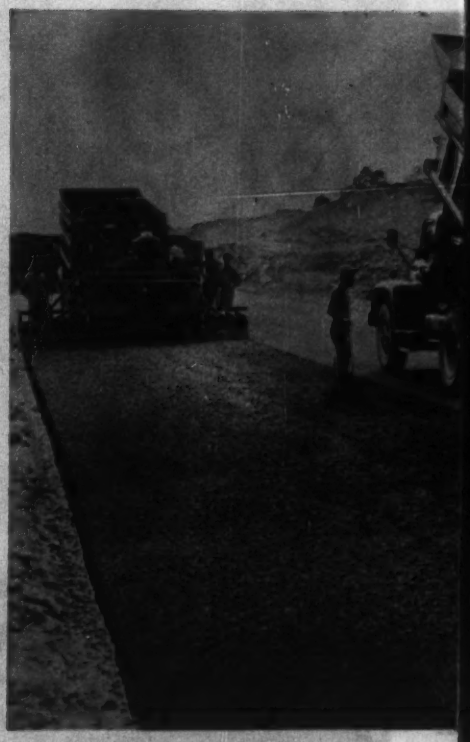
Guillaume Gillet was the architect. He was assisted by two consulting engineers, Rene Sarger and Jean Prouve. Plans were prepared and construction carried out by Societe des Anciens Etablissements Eiffel.

TRUSSED PIPE COLUMNS carried the weight of the inclined trusses along the edges of the roof. Roof-supporting cables ran diagonally between those trusses.


(Correlation between Saybolt Furol and Kinematic viscosity is approximate only.)
Saybolt furol viscosity, seconds
25 30 40 50 70 100 150 200 300 400 600 800 1000
Mixing range
Spraying range
Asphalt C
Asphalt B
Asphalt A
Temperature degrees fahrenheit
175 200 225 250 275 300 325 350
50 60 80 100 150 200 300 400 600 800 1500 2000
Kinematic viscosity, centistokes

TEMPERATURE MANIPULATION achieves viscosities recommended for different job applications. When different asphalts are involved, different temperatures may be necessary to get similar viscosities.

Viscosity-temperature relationship is important . . .



. . . for more uniform asphaltic

Viscosity: A Key to Better Asphalt Road

John M. Griffith
Engineer of Research
The Asphalt Institute
College Park, Maryland

To assure more uniform asphaltic road construction of the highest quality, it is time to make a distinct break with the past and give new attention to a fundamental property of asphaltic materials—viscosity.

Viscosity is that property of a fluid that causes it to resist flow. Fluidity is the inverse of viscosity—the higher the viscosity, the lower the fluidity or ability to flow.

In the case of asphalt, a thermoplastic material, viscosity is varied by heat. Lower the temperature and viscosity increases. Raise the temperature and fluidity increases.

When you recognize that for a specific job application there is an "optimum" asphalt viscosity that will provide the best results, the temperature at which asphalt is used is of significant importance.

The standard Penetration Test in asphalt specifications has its limitations. How far an arbitrarily designed needle will penetrate in units of 0.1 mm at a temperature of 77F and under a load of 100 grams, cannot be used as a basis, in most cases, for establishing application temperatures in construction.

What we advocate, therefore, is an understanding of the characteristics of the viscosity-temperature relationship and appropriate use of such knowledge for improved qualitative control in asphaltic construction.

As a start, the Asphalt Institute has a number of recommendations to make about the viscosity range in mixing and spraying:

• **For mixing**—Asphalt and aggregates should be mixed at a temperature that will give a viscosity within the range of 75-150 seconds, as determined by the Saybolt Furol Viscosity Test.

A range is recommended since optimum mixing viscosity may vary depending upon type and gradation of aggregates used. Also, experience in the viscosity approach is still so limited that data and information are insufficient to warrant establishing a more precise viscosity.

It can be said however that the higher viscosities within the 75-150 range are usually more suitable for coarse aggregate mixing; the lower viscosities are more suitable for fine aggregate mixes. Principal reason for this is that slightly greater asphalt film thicknesses are desirable for coarse, open-type paving mixtures than for fine-textured and dense mixtures. Also, a viscosity on the high side of the range curbs the tendency of asphalt to drain from the coarse, open-type of mix while being hauled to the construction site.

Further experience should lead to a precise viscosity for best conditions for a particular mix.

• **For spraying**—Where asphalt spraying is concerned, the Institute recommends that the asphalt be heated to a temperature that would bring viscosity in the range of 25-100 seconds Saybolt Furol (SSF).

The higher viscosities in this range are normally used for penetration and sealing of open surfaces. Those on the lower side of the range are used for applications on dense surfaces.

It should be noted, however, that selecting a spraying viscosity for the type of surface is of secondary importance. More important is selecting a viscosity for the most efficient spraying. For one thing, the temperature of the sprayed asphalt drops appreciably before it reaches the surface. For another, surface penetration is governed largely by the particular type and grade of asphalt that is used.

mixes . . .

. . . and better asphalt sprays

Construction

• **Equating asphalts**—It is true that asphalts, being derived from crude petroleum sources from all over the world, vary in physical characteristics. The relationship between temperature and viscosity may not be the same for different sources or types and grades. Yet these variations need not affect the satisfactory use of asphalts if construction procedures are properly adjusted.

When the proper viscosity of an asphalt to be used in construction has been established, temperature-viscosity data should be plotted on a chart.

Plotted in the accompanying chart are temperature-viscosity data selected at random for asphalts of the same (85-100) penetration grade but having different temperature-viscosity characteristics. For all practical purposes a straight-line plot of data points can be used for interpolation.

Now, assume that a viscosity of 100 SSF has been selected as proper for the mix under consideration. It is seen that Asphalt A should be mixed at a temperature of 315 deg F, Asphalt B at 302 deg and Asphalt C at 280 deg. to achieve the desired viscosity.

Or looking at it another way, assume that it is the standard practice of a contractor to prepare asphalt paving mixes at 300 deg F. At this temperature, the graph shows that Asphalt A will have a viscosity of 150 SSF, Asphalt B—107 and Asphalt C—57.

It is apparent that, using the same mixing procedures, Asphalts A and C would not give results comparable to each other or to Asphalt B—the one that is closest to the desired 100 SSF. Asphalt A, being more viscous at 300 deg, would require a longer period of mixing to achieve a uniform coating. Asphalt C's temperature is higher than required for proper mixing and subjects the asphalt to unnecessary hardening and oxidation. Also, if the mix were of coarse, open gradation, Asphalt C would tend to drain from the aggregate surface during hauling.

• **Give contractor leeway**—After determining the proper application temperature from plotted data, the specifier must give the contractor a reasonable operating tolerance. Obviously, the contractor will not be able to maintain a precise temperature throughout construction, although it is desirable.

The Institute recommends a construction tolerance of plus or minus 10 F from that temperature selected to provide the desired viscosity. Where mixing operations are concerned, the specified temperature and permitted tolerance should apply to the mixture as it leaves the mixing chamber.

Another step forward in better asphaltic roads appears to be finding an optimum viscosity for mix compaction. No doubt the characteristics of the aggregates in the mix would exert considerable influence. The Asphalt Institute welcomes any data on this subject that may now be available or that may become available in the future.

On Measuring Viscosity . . .

This article has quoted viscosity data as determined by the Saybolt Furol Viscosity Test, which is the test most familiar to asphalt paving engineers.

Simply described, with this test viscosity at a certain temperature is determined by the time, in seconds, it takes a measured amount of asphalt at that temperature to pass through a narrow orifice.

A desirable objective, however, would be to measure viscosity in fundamental units, either Absolute (or Dynamic) Viscosity or Kinematic Viscosity. Units for these measurements are Poises and Stokes respectively and the Kinematic Viscosity is the quotient of the Absolute Viscosity divided by the density of the fluid. Thus, it may be seen that these two fundamental measurements may be interrelated.

Precise measurements of this nature are difficult to make, however, and it has been found that viscosity measure-

Schramm 125 cfm Pneumatractor Rotadrill is a complete self-contained air compressor and self-powered drill rig which drives anywhere and sets up in minutes. Drills a 4¼" hole to a depth of 500 feet with 10,000 pounds down pressure.

SCHRAMM ROTADRILLS . . .

Remove more rock at less cost

Compressed air, long the contractor's most important power supply for construction tools, now is your most important aid in rock drilling. With Schramm Rotadrills (rotary and bottom-hole drilling rigs), your cubic yard costs on rock removal work are drastically cut. Tough jobs are made easier . . .

Faster drilling rates. Rotadrills penetrate faster than other rigs because hydraulic down pressure is automatically regulated and an abundant supply of air removes the chips instantly and keeps the hole clean. Contractors report increased penetration of 55% to 66% in hard rock.

Fewer holes to drill. Larger diameter blast holes with Rotadrill mean more explosives per hole and fewer holes to drill. Jobs move faster, cost less.

Less manpower. One man can move machine, drill, change steels without assistance. Sets up, ready to go in minutes—takes fewer man hours.

Lower cost per foot. Schramm Rotadrills save time and manpower—cost less to operate. Let us show you how to cut your drilling costs with the Schramm Rotadrill. Write today for complete information.

See the Yellow Pages for Sales, Service and Rental of Schramm Rotadrills.

Schramm 250 cfm Pneumatractor Rotadrill averages 12′ to 15′ per hour in very hard limestone with straight rotary drilling. With Rotatool, for bottom hole drilling, rates exceed 22′ per hour in hard limestone and 15′ per hour in trap rock.

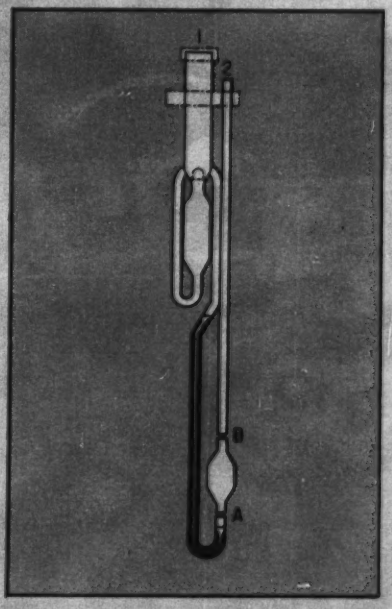
Truck Mounted Rotadrills are gasoline or diesel engine driven, drill 6" holes with 26,000 pounds down pressure. Also available, Crawler Rotadrill (8" holes with 28,750 pounds down pressure) and "Do-it-yourself" package for mounting on your truck or tractor.

Schramm, Inc.

MANUFACTURERS OF AIR COMPRESSORS

610 North Garfield Ave. • West Chester, Pa.

. . . Use capillary viscometer



ments made by means of the capillary-type, reverse flow viscometer may be readily converted to units of kinematic viscosity by employing an established formula. Such a capillary viscometer is typified by the Lantz-Zeitfuchs type (sketch above) described in Appendix C of ASTM Designation D 445. The test is made as follows:

Heated asphalt is poured into the filling tube, Point 1, until it overflows. The system is kept at proper testing temperature by an oil-heating bath.

Flow through the capillary section is started by applying a slight vacuum at Point 2 or slight air pressure at the filling point. After the asphalt reaches a point in the capillary restriction opposite Point A, the pressure or vacuum is removed and asphalt flows under its own head around the bend in the capillary and between Points A and B. The time required to fill the expanded portion of the tube between these two points is measured and Kinematic Viscosity, in Centistokes, is determined by formula.

While it is also possible to convert viscosity measurements from the Saybolt Furol test into units of Kinematic Viscosity, this is not so readily or accurately accomplished. Limited tables for this purpose have been prepared by the ASTM for conversion of Saybolt Furol units to Centistokes, but only at temperatures of 100 deg F and 210 deg F. Interpolations or extrapolations must presently be used for conversions at other temperatures.

Thus, petroleum technologists generally prefer the simpler and more accurate capillary viscometers to establish Kinematic Viscosity.

Your men, your equipment...wherever they go Hartford protection goes with them

Your jobs can take your men almost anywhere. To the next county . . . a distant state . . . even another land. *And where those men and your equipment go, your protection can go, too.*

You cannot buy more complete coverage than the Hartford offers. Or get it more easily than through a Hartford Group Agent or your insurance broker. The organization they represent can insure you against virtually all risks of property loss, cover your legal liabilities and serve all your bonding requirements.

If trouble comes. No matter where a problem situation may develop, Hartford is set up to give you fast, competent help. For we maintain more than 200 Claim Offices and 64 Engineering Department Offices strategically located from coast to coast. Trained personnel—underwriting experts, claimsmen, auditors and engineers—are at every point ready to go into action at your call.

Workmen's Compensation? Its ins and outs need never bother you. Our men know the varied requirements peculiar to every area, East Coast to West, Canada to the Gulf . . . in fact, throughout the world. *And claim service?* Always rendered in the manner traditional with the Hartford, it's prompt . . . efficient . . . considerate . . . fair.

Ask some of the contractors you know what they think of Hartford protection and service. And see how many of them agree on this:

Year in and year out you'll do well with the

HARTFORD
Fire Insurance Company
GROUP

Hartford Fire Insurance Company
Hartford Accident and Indemnity Company
Hartford Live Stock Insurance Company
Citizens Insurance Company of New Jersey, *Hartford 15, Connecticut*
New York Underwriters Insurance Company, *New York 38, New York*
Northwestern Fire and Marine Insurance Company
Twin City Fire Insurance Company, *Minneapolis 2, Minnesota*

Take it from the man in the driver's seat... here are big reasons

why operators recommend ...to increase your daily

"The International Payscraper does not nose over or up in tight spots," states Operator Cecil Dickson, for C. & Z. Construction Co., Memphis, Tenn. The three "75's" in this fleet each get a heaped 22-yard load in 25-32 seconds—with the TD-24 as pusher. The job: building farm-to-market road near Covington, Tenn.

Operating safety is essential on mountain terrain. Ripon Construction Co., working near Weaverville, California, appreciate International "75" Payscraper safety — handling a subcontract on a road in mountainous Trinity County, with three "75's" and two TD-24's for pusher power. Cuts run to 75 feet deep!

Payscrapers production!

This new TD-20 is pusher for a pair of fast-loading "55" Payscrapers—on a street improvement project in Denver. Horn Construction Co. is the contractor.

Riding on the shock-absorbing, deep-padded seat, the International Payscraper® operator soon learns he can cross rough spots—ascend or descend steep pitches, loaded or empty—without neck-snapping, spine-smacking jolting or bouncing. He practically gets automotive riding comfort!

When he needs positive braking, he has powerful, heavy-duty four-wheel air brakes—synchronized on both tractor and scraper wheels—to decelerate and stop surely, even with heap loads on steep grades. And for "walking" the rig through soggy going, he has auxiliary hand-braking of the individual drive wheels!

Guiding a big earthmover is no longer an athletic event—no longer demands "muscle" or tussle! The Payscraper gives him exclusive Hydro-Steer—hydraulic steering powered for smooth, positive one-hand turns! Even the clutch is air-assisted for operating ease and fast, positive action!

And an operator has no fear of "nose-diving" or jack-knifing—not with International Payscraper design! The oscillating hitch assembly and forward pitched spindle prevents these machine contortions! Low center of gravity means extra stability, too, on uneven terrain.

These are big reasons why operators have the confidence to use full Payscraper power and speed—to give you full capacity and cycle-speeding loading, hauling, and return!

"Our three '55' Payscrapers are best for our land clearing and stripping needs in this sandy area—and we compared thoroughly with competitive machines," states Tom Hutchinson, for Hutchinson Bros., Inc., Pompano Beach, Fla. "We like the way the '55's' boil up a full load fast; then get to the fill and back quick."

Get in the driver's seat—get the operator's feel of International Payscraper performance. See for yourself what a big factor complete operating ease and confidence can be in increasing earthmover capacity! See your International Construction Distributor for a demonstration!

International® Construction Equipment

International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors...Self-Propelled Scrapers and Bottom Dump Wagons...Crawlers and Rubber-Tired Loaders...Off-Highway Haulers...Diesel and Carbureted Engines...Motor Trucks...Farm Tractors and Equipment.

NEW International® Drott with Four-In-One

CAPACITY... to outload 100 hp "single-action" rigs

PLUS VERSATILITY UNLIMITED... of exclusive clam-action

Sized, powered, geared, and controlled to decisively outproduce any "single-action" loader in the 100-hp field—the new 2¼ cu yd TD-15 4-In-1 gives you exclusive International Drott clamshell action!

Here's new big-job-sized versatility unlimited! Simply move the selector lever from the tractor seat with fingertip ease—to get any one of four big-capacity machine actions needed. On big job after big job, the TD-15 4-In-1 can replace costly limited-action machines one after another!

And whether this 4-In-1 replaces four or forty machine actions for you, you get it for one moderate price!

Smooth, years-proved, 115 hp 6-cylinder International diesel engine in the new TD-15 4-In-1 gives you full advantage of increased hydraulic system capacity—of new 6-speed, full-reverse transmission mobility—of new cycle-speeding forward-reverse Shuttle-Bar control!

Correct balance and long-track stability eliminate the need for counter-weighting the TD-15 4-In-1. Track length on the ground is a full 98⅜ inches!

There's only one way to size-up new TD-15 4-In-1 performance—to measure its job range and capacity—to compare its money-making capabilities to a yard-full of one-purpose rigs. That's to get on the deep-cushioned seat and prove to yourself what it can do. See your International Drott Distributor for a demonstration!

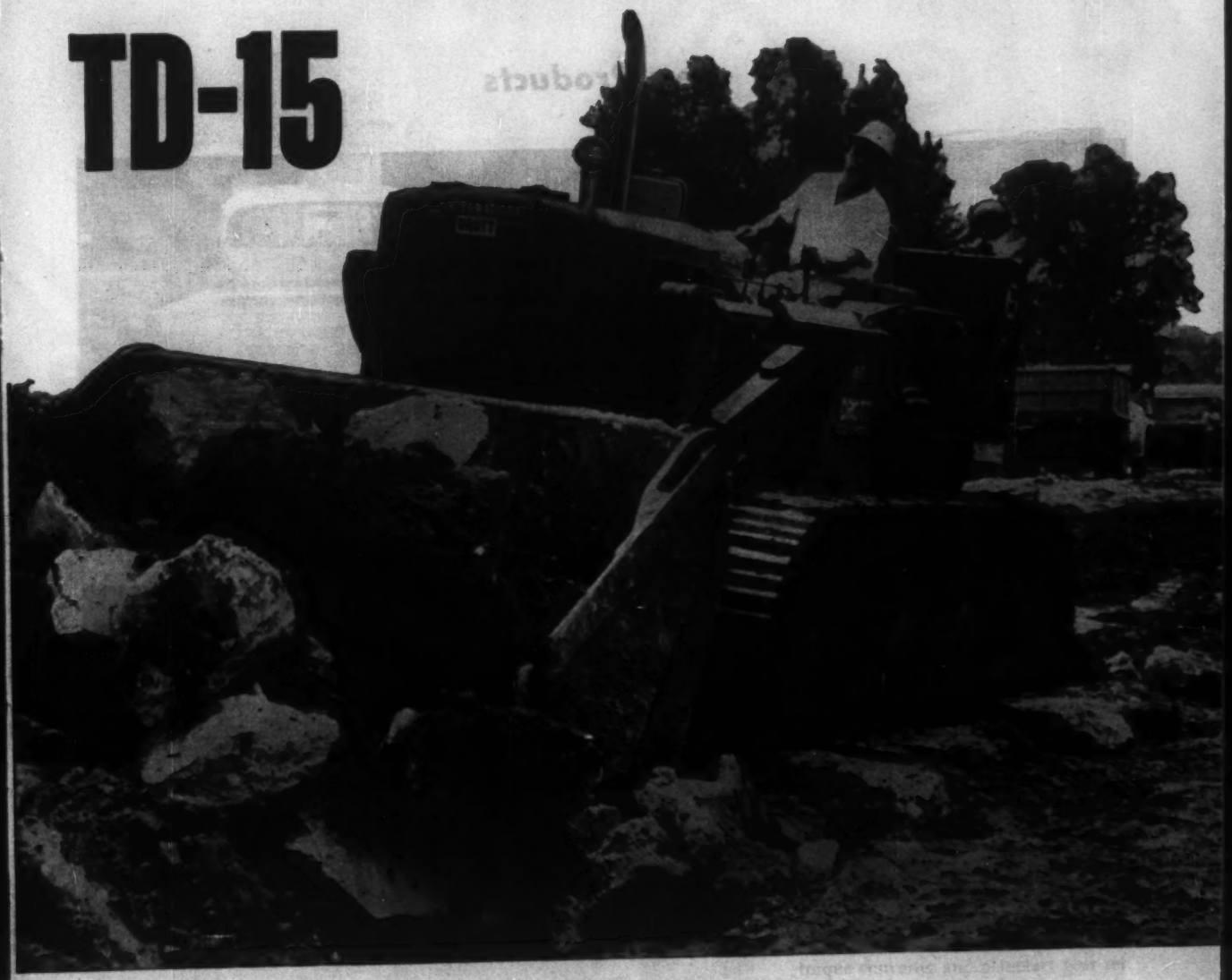
"Concrete-bucking" pry-action break-out breaks up, digs up, and loads out old pavement — gives a big profit-advantage to the contractor, over single-action rigs that lack 4-In-1 *pry-over-shoe* power! The new TD-15 4-In-1 exerts the tremendous break-out force of 42,650 lbs.

As a "carry-type scraper" with cutting edge grading-off an even layer, and "boiling" the bucket full, the new TD-15 4-In-1 gives you a multitude of profitable uses. It can grade, strip, spread, or load-in-place a wide variety of materials with amazing accuracy!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL DROTT

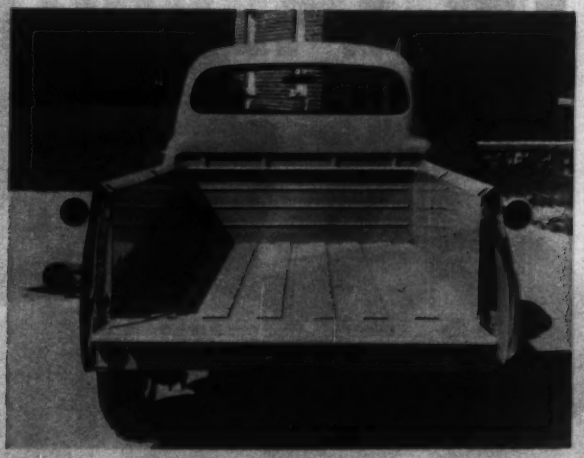
TD-15



You'd need a heavy-duty blade outfit to match the earth-rolling material-digging performance of the new TD-15 4-In-1! You regulate dozing depth accurately with "radius control," hydraulically, from the tractor seat.

"Back-dragging" with exclusive clamshell action—new TD-15 4-In-1 reduces time and cost of "dressing" a bank—or pulling down material by the truckload! Shuttle-Bar control speeds up back-and-forth cycles on jobs like this!

Chevrolet Apache Suburban $3,301



Studebaker 112-inch Wheelbase Pickup $2,731

Ford, not yet available; price not set

Dodge W100 Carryall $3,144

The 1959 Line of Four-Wheel-Drive

Here is the 1959 collection of all popular brands of light-duty, four-wheel-drive trucks designed for use in the field.

Prices quoted are "factory list." This generally excludes everything but the dealer markup. These prices are only indications of what you may pay. See your dealer for what you will pay.

Chevrolet—Called a motorized packhorse, Chevrolet's "Apache Suburban" (shown) is one of 14 all-wheel-drive models. They range from ½- to 1-ton capacity.

Only one engine is offered: an overhead valve six of 135 hp that puts out 217 lb-ft of torque. The company also limits transmission choice to a 4-speed, syncromesh gearbox.

Like most makers, Chevrolet has designed its power divider for single-stick control. Positions are 4-wheel underdrive, neutral, 2-wheel direct and 4-wheel direct. Shifting between the latter two requires no clutching whether the truck is moving or not.

There are three power take-off openings on the power divider and one on the transmission. A front-mounted winch is optional at extra cost.

A useful accessory is free-wheeling front hubs to disengage these wheels during highway operation.

Studebaker—Rear view of Studebaker's all-wheel-drive, ½-ton pickup illustrates its outstanding feature. It has the widest (51½ in.) clear floor in the industry.

With a 112-in. wheelbase (shown), the body is 6½ ft long; on the 122-in. chassis it extends to 8 ft. Another advantage is that Studebaker trucks are up to 6 in. lower in over-all height than the competition, without appreciable sacrifice in road clearance.

A choice of a 245-cu-in. six or a 289-cu-in. V-8 is offered. The latter puts out 225 hp at 4,500 rpm. A 4-speed, manually operated gearbox is the only one available.

Willys Universal Jeep—A far cry from the boxy workhorse of World War II is Willys' current CJ-5 Jeep (shown) with its streamlined styling and automatic windshield wipers. Vital statistics include: over-all length, 135.5 in.; width, 72 in.; and wheelbase, 81 in.

A 72-hp, 4-cylinder, F-head engine is

Willys Universal Jeep $1,820

Willys Cab-Forward Jeep $2,338

GMC Suburban Carryall $3,438

International Harvester Travelette $3,457

Light-Duty Trucks

standard, giving a torque of 114 lb-ft at 2,000 rpm. The shorter, 2-wheel-drive Jeep "Dispatcher" uses a 60-hp, L-head four.

The Jeep could hardly be called "universal" without benefit of the great range of factory engineered or approved accessories. The 300 amp, Farnsworth & Middlekauff welder in the vehicle pictured is typical. Koenig Iron Works furnishes Willys with a line of full and half cabs for all-weather protection rivaling that of a passenger car. Body extensions are available to convert the Jeep into an approximation of a pickup.

Willys Cab-Forward Jeep—In addition to the "Universal" Jeep and a line of four-wheel-drive pickups and station wagons with orthodox engine positioning, Willys has recently added two "cab-forward" models.

The pin-neat FC-150 (shown) has the same engine and wheelbase as the Universal Jeep. But maneuverability is lessened by the greater over-all length. Cargo space, however, is comparable to a Jeep and trailer.

A larger model, the FC-170, is mounted on a 104-in. wheelbase. With its gross vehicle weight rating of 7,000 lb, more cargo capacity per inch of wheelbase than any other truck in its weight class is claimed.

This unit is equipped with an L-head six of 105 hp, permitting negotiation of grades up to 65% with full rated payload. The FC-170, priced at $2,643, is available with 3- or 4-speed manual transmissions as well as an automatic torque converter and planetary gear set.

Optional power take-off can be mounted at front, center or rear.

Ford—Ford has entered the all-wheel-drive field for the first time with two series of ½- and ¾-ton capacity. Previously, Ford off-highway equipment has been converted from standard 2-wheel-drive units by independent suppliers.

Shown is an early prototype undergoing tests on a 65% grade at the company's proving grounds. The truck will not be available until the end of the year.

Both series are mounted on a 118-in. wheelbase. Factory-available body styles are limited to two types of pickups. However, it can be ordered with only a cab for shipment to custom body builders.

There is a choice of six-cylinder or V-8 engines. The six is rated at 139 hp and puts out 207 lb-ft of torque between 1,800 and 2,700 rpm. The V-8 claims 186 hp with 260 lb-ft of torque

Need a building ...FAST?

SWISS-LOK Tubular Building Frames offer these exclusive advantages:

Vastly cut erection time, crane service and labor costs
No welding, cutting, riveting or bolting at the site
One-third less weight without strength sacrifice

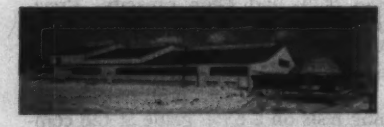
One crane is sole equipment needed and its time is ⅔ less because of fast SWISS-LOK connections.

Using the patented SWISS-LOK, all structural parts slip together quickly, providing a rigid structure that meets all A.I.S.C. requirements. The SWISS-LOK "keystone" permits wide spans without center columns.

The rigid-type truss chords parallel the roof slope, providing more overhead space for materials movement and storage.

All new, tested pipe is used exclusively in SWISS-LOK structures.

All structural frame members can be hauled by trailer truck, providing fast delivery, convenient spotting and reduction of handling.



SWISS-LOK structural framing is independent of roofing or siding. Any type may be used and standard wall tying and sheet metal fastening are applicable. There is no reliance upon wall or roof construction for support, alignment or rigidity.

SWISS-LOK structures are applicable to any style building — industrial, warehouse, institutional, public or commercial. For descriptive, illustrated literature write:

SWISS FABRICATING, INC.
Office and factory
Camp Horne Road, Pittsburgh 2, Pa.

at 2,200-2,700 rpm. Manual transmissions in 3 or 4 speeds are optional.

Dodge—Dodge "Power Wagons" rank next to the Jeep in familiarity. The company has built and still builds thousands of them for the military services.

The W100 Carryall (shown) offers either six- or eight-passenger seating. It is rated at 6,000 lb gross vehicle weight. Standard engine is 120-hp, L-head six-cylinder with 202 lb-ft of torque at 1,600 rpm. A 205-hp V-8 is optional at extra cost.

Dodge is the only truck maker to offer a pushbutton automatic transmission. Other gearboxes available include 3- and 4-speed manually operated units.

Optional power take-off mounts on the transfer case. A power winch can be installed on all models.

The company's range of all-wheel-drive vehicles extends to 20,000 lb gross vehicle weight. A model of particular interest to the contractor is the W300M pickup. It is patterned after military designs with a minimum of overhanging (and thus easily damaged) sheet metal.

GMC—GMC calls its ½-ton, 4-wheel-drive line the "Big Three" to indicate the number of body styles available. There is a panel delivery, an eight-passenger "Suburban" Carryall (shown) and a pickup.

Of interest to contractors is availability of "Fleet Series Options". A unit so ordered comes without such items as fancy grill and dual headlights. Price is lowered accordingly.

GMC gives a choice of six-cylinder and V-8 engines. The six is a time-tested overhead valve design of 130 hp and 238 lb-ft of torque at 1,200 rpm. The V-8 puts out 307 lb-ft of torque at 2,000 rpm, reflecting a horsepower boost to 200.

Manual transmissions in 3 or 4 speeds are available. So are Hydra-Matic, power steering and power brakes.

INT International Harvester—The recently introduced "Travelette" (shown) carries six men plus a generous cargo. It is one of five bodies supplied on International Harvester's A-120, all-wheel-drive chassis. Wheelbases range from 110 to 129 in.

The series is rated at 7,000 lb gross vehicle weight. Power is by a 141-hp, overhead valve, six-cylinder engine. A 154-hp six is optional at extra cost. Either engine can be factory-equipped for operation on LP gas.

Manual transmissions are available in 3 and 4 speeds. The power take-off, when specified, is mounted on the transfer case to transmit full engine torque to allied equipment such as an optional factory-mounted winch.

Other light-duty, all-wheel-drive units include the A-140, rated at 11,000 lb gross vehicle weight, and the A-160, rated at up to 180,000 lb.

. . . New Product Briefs

• **Sand blaster**—A low-cost sand-blasting machine is offered that will operate on any garage type air compressor producing at 100 to 185 psi. A. L. C. Company, 646 Oak St., Medina, Ohio.

• **Foot pedal**—A foot-operated decelerator for the Caterpillar D8 tractor permits the operator to slow the engine without using the hand throttle. When the decelerator is released, the engine returns automatically to the hand throttle setting. This optional device is connected to the diesel engine governor and is entirely independent of the hand throttle setting. Caterpillar Tractor Co., Peoria, Ill.

• **Bricklaying corner guide**—This new patented device reportedly eliminates the need for corner poles, deadmen and plumb lines in laying brick veneer. The device consists of two angle assemblies for outside corners and two for inside corners. Freeland Enterprises, P. O. Box 411, Freeland, Mich.

• **Multipurpose ladder**—The "Extend-a-step" ladder may be converted from a step ladder to an extension ladder, or into two separate ladders. Patent Scaffolding Co., Inc., 38-21 12th Ave., Long Island City 1, N. Y.

• **Brightness control glass**—A gray sheet glass helps control light environment for building areas. "Graylite" comes in two thicknesses: a ¼-in. glass that provides a visible light transmittance of 31%; and a ⅜-in. sheet that provides visible light transmittance of 13% and a radiant energy transmittance of 45% to 50%. The sheets are available in stock sheet sizes up to 60 x 84 in. Pittsburgh Plate Glass Co., 632 Fort Duquesne Boulevard, Pittsburgh 22, Pa.

• **Concrete slump cone**—A new seamless slump cone makes slump tests on concrete easier and more efficient, according to the manufacturer. The seamless slump cone is made of heavy gage cadmium plated sheet metal and is of one piece construction. The handles and foot clamps are welded in position. Soiltest, Inc., 4711 W. North Ave., Chicago 39, Ill.

CRANE swings insulated form section in place on Lee Interchange Bridge, part of the Massachusetts Turnpike. Forms were used 3 to 5 times. B. Perini & Sons, Inc., Framingham, Mass., was the contractor.

BIG REACH: Crane swings heated concrete to hopper for buggy delivery to remote sections of Western Avenue Reservoir roof. Remainder of pour, direct from bucket, went quickly. Reservoir was designed under supervision of George S. Salter, chief filtration engineer, City of Chicago. Contractor, M. J. Boyle & Co., Chicago.

HEATED TO 75°, concrete steams during hand pour of Chicago reservoir roof. At times, surface temperature of concrete dropped to low 40's, but climbed again when tarpaulins were replaced.

Two ways to put the heat on winter work

There's interesting contrast in the methods used to keep concrete warm on these two winter jobs. One contractor used a heated enclosure, the other insulated his forms. Both kept the concreting on schedule in sub-freezing weather.

On the Lee Interchange Bridge, the forms were insulated with wood fiber cellulose blankets. Thus insulated, the heat from 170° mix water and 60° aggregates, plus the heat of hydration in the setting concrete, kept internal temperatures sufficiently high for the entire curing time.

Roof pours for the Chicago reservoir were made with mix heated to 75°F. Forms were covered by 55,000 sq. ft. of canvas and heated with 8,000,000 BTU per hour from 44 heaters. This maintained the high curing temperatures needed. Tarps were removed only in the roof section being poured (4 one-day pours handled the job), then replaced.

Efficient winter pours are made possible by using ready-mixed concrete properly processed and delivered at specified temperatures by truck mixers of certified design, capacity, mixing speed and water control accuracy.

You have a right to insist on this Rating Plate. It certifies compliance with the high industry standards maintained for your protection by the Truck Mixer Manufacturers Bureau.

BLAW-KNOX CONSTRUCTION EQUIPMENT DIV.
Mattoon, Ill.
CHAIN BELT COMPANY
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CHALLENGE MANUFACTURING CO.
Los Angeles, Calif.
CONCRETE TRANSPORT MIXER CO.
St. Louis, Mo.
CONSTRUCTION MACHINERY CO.
Waterloo, Iowa
THE JAEGER MACHINE COMPANY
Columbus, Ohio
THE T. L. SMITH COMPANY
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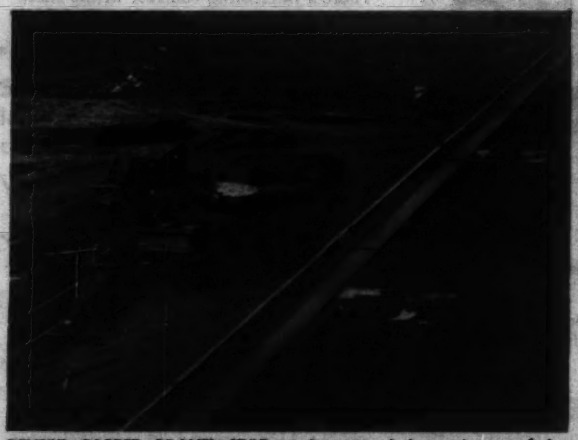
Indianapolis, Ind.
WHITEMAN MANUFACTURING CO.
Pacoima, Calif.
WILLARD CONCRETE MACHINERY CO., LTD.
Lynwood, Calif.
WORTHINGTON CORPORATION
Plainfield, N. J.

Connecticut General Life

Architects: SKIDMORE, OWINGS & MERRILL.
Mechanical Engineers: SYSKA & HENNESSY.
Consultant—Building Methods & Materials: WALTER C. VOSS.
General Contractor: TURNER CONSTRUCTION CO.
Mechanical Contractor: KERBY SAUNDERS, INC.
Plumbing Contractor: C. H. CRONIN.
Roofing and Sheet Metal Contractor: SOUTHERN NEW ENGLAND ROOFING CO.

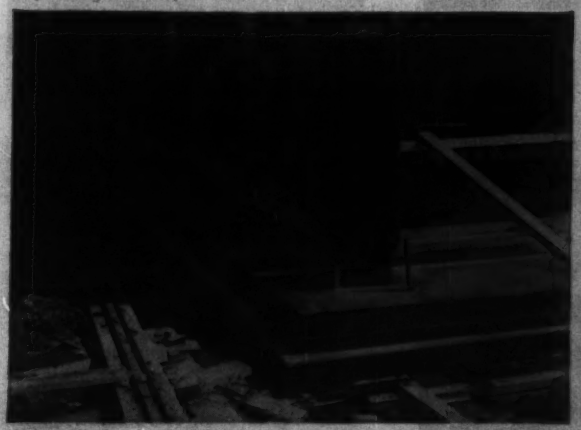


REVERE COPPER GRAVEL STOP running around the perimeter of the building with expansion joints every 24 ft.

AERIAL VIEW SHOWING the Connecticut General Life Insurance Company's new home office building in suburban Hartford.

REVERE COPPER BASE FLASHING at the north wing penthouse, with expansion joints every 24 ft.

BOILER ROOM louvers are of Revere lead-coated (Leadtex) Copper with bronze screening on the inside.



HERE YOU SEE THROUGH-THE-WALL FLASHING of Revere Copper that runs around the entire perimeter of this great building.

CLOSE-UP of the 54" sill flashing before granite base was put in place.

Insurance Co.

counts on

REVERE SHEET COPPER

. . . to help protect its new architectural "dream" at Bloomfield, Conn.

Copper was used for flashing, louvers, gravel stops and edge strips

Rule-of-thumb and guesstimating were left outdoors when this building was being planned. There were more than 500 conferences with client, architects, builders and consultants over a planning period of 4½ years. For Frazar Wilde, President of Connecticut General, was building to last, with the nearest possible thing to "no maintenance costs for 50 years and preferably 75."

And the construction materials were chosen on this enduring basis. A mock-up was made and materials were tested under actual conditions to which they would be subjected . . . from exterior hurricane weather tests to the positioning of furniture. We welcome such painstaking testing of copper because man's oldest metal has a set of outstanding characteristics that no other material can match.

There were some 42,638 lbs. of Revere Sheet Copper, most of it being 20 oz. cold rolled, with the bulk being used for base flashing around the entire perimeter of the building under the granite (see photos opposite page). Revere Sheet Copper was also used for base flashing, gravel stops, edge strips and, in lead-coated form, as louvers around the pump house, and boiler rooms in combination with bronze screening.

119,000 LBS. OF REVERE COPPER WATER TUBE AND THREADLESS PIPE USED FOR AIR CONDITIONING AND PLUMBING LINES

In keeping with the owner's desire for enduring materials, Revere Copper Water Tube and Threadless Pipe were used throughout the building in sizes ranging from 3/32" to 4". Both KERBY SAUNDERS, INC., Mechanical Contractor and C. H. CRONIN, Plumbing Contractor, will tell you that by prefabricating sections in their shops and because of its fast, simple method of installation, copper water tube costs less to install than rustable material, while its non-corrosive qualities will result in a lifetime of performance.

Again and again you'll find copper in sheet and tube form being used in the buildings that are built to last. And that goes for the traditional or the most modern type of architecture. The designs made possible by sheet copper are legion. So you would do well to plan with copper when you plan for the future. Our Technical Advisory Service will be glad to help. LOOK FOR OUR CATALOG IN SWEET'S FILE

REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, N. Y.

Mills: Rome, N.Y.; Baltimore, Md.; Chicago, Clinton and Joliet, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Brooklyn, N.Y.; Newport, Ark.; Ft. Calhoun, Neb. Sales Offices in Principal Cities, Distributors Everywhere.

COPPER + BRASS 18 01 REVERE ALUMINUM

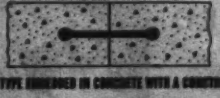
How to Choose Waterstop for optimum performance in concrete joints

Basic Design And Resilience Most Important Factors

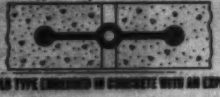
The principal function of waterstop is to keep concrete joints watertight where hydrostatic water pressure is present. To be effective, and to perform its function under widely varying conditions, the waterstop must:

1. **Be designed in such a way that it will maintain a "pressure seal" when the joint is opened up or compressed, or when hydrostatic pressure is exerted against it.**
2. **Be made of a material that is inherently stable and resilient...that will retain its resiliency and strength under wide ranges of temperature.**

There is general agreement by many governmental and private specifying authorities, after years of testing and actual installation, that the dumbbell design of waterstop (below) is mechanically superior to any which has been developed to date. The design provides a self-sealing action, because as the concrete contracts and the joint opens up, the outer edges of the dumbbell bulbs become more tightly engaged with the concrete, insuring a tighter seal as the tension increases, due to movement either in the joint or increasing water pressure on one side of the joint. In effect, the greater the longitudinal pull or pressure on one side, the more tightly the dumbbell ends are pulled and squeezed against the concrete. The simpler dumbbell design of the rubber waterstop allows full strength and contact with the concrete surrounding the waterstop. The larger design also provides for maximum strength to resist higher pressures on the web of the waterstop across the joint opening.



6" DUMBBELL TYPE EMBEDDED IN CONCRETE WITH A CONSTRUCTION JOINT



6" HOLLOW BULB TYPE EMBEDDED IN CONCRETE WITH AN EXPANSION JOINT

Rubber and vinyl are the most commonly used waterstop materials. For the majority of applications, rubber is the most satisfactory material. Being a thermosetting material, rubber is more resilient and "live"...will maintain a constant pull against the retaining edges (bulbs) as the joint opens up or water pressure increases. Vinyl is a thermoplastic compound and tends to take a "set" after it has been stretched, will float in the joint cavity, and have less resistance to the passage of water. When higher temperatures are present, such as in oil storage tanks, where oil is kept at temperatures around 150°F., the vinyl material, unless specifications are rigidly written, will soften and lose strength, causing a failure of the waterstop.

Field Splicing of Dumbbell Type

Servicised Products Corporation has developed a new Union which provides a simple method of joining the ends of dumbbell waterstops, making it just as fast and easy to field splice rubber and neoprene waterstop as the joining of the polyvinylchloride types.

The Union is made in the same cross-section, and from the same material as the waterstop. It is hollow, except for a solid web at the center. After adhesive is applied to the waterstop ends, they are inserted in the Union and pushed against the centering web. The splice is then clamped together until the adhesive has set. This completes the splice.

Dumbbell type rubber and neoprene waterstop are fully described in a special Waterstop Circular available from Servicised Products Corporation upon request. The Union and an interesting new development, Split Type, are also illustrated and described in the circular. Write for it today.

SERVICISED PRODUCTS CORPORATION
6051 W. 65th Street, Chicago 38, Illinois

Publications

Pumps—A catalog covering Continental utility pumps that incorporate the helical screw principle. No vanes, turbines or impellers are needed. 8 pages. CONTINENTAL PUMP CO., 1027 So. VANDEVENTER AVE., ST. LOUIS 10, MO.

Tunneling—A pamphlet reporting on the Stornorrfors power project in Sweden. 8 pages. ATLAS COPCO EASTERN, INC., 610 INDUSTRIAL AVE., PARAMUS, N. J.

Rock salt road—A seven step method of road improvement using rock salt, shown through cartoons and text. 10 page booklet. HIGHWAY SALES DEPARTMENT, INTERNATIONAL SALT CO., SCRANTON, PA.

Powder tools — How powder-actuated fastening tools can be used on highway construction for fastening forms, conduit, concrete ties, drainage pipes and gutters. 4 page booklet. RAMSET FASTENING SYSTEM, OLIN MATHIESON CHEMICAL CORP., 12117 BEREA ROAD, CLEVELAND 11, OHIO.

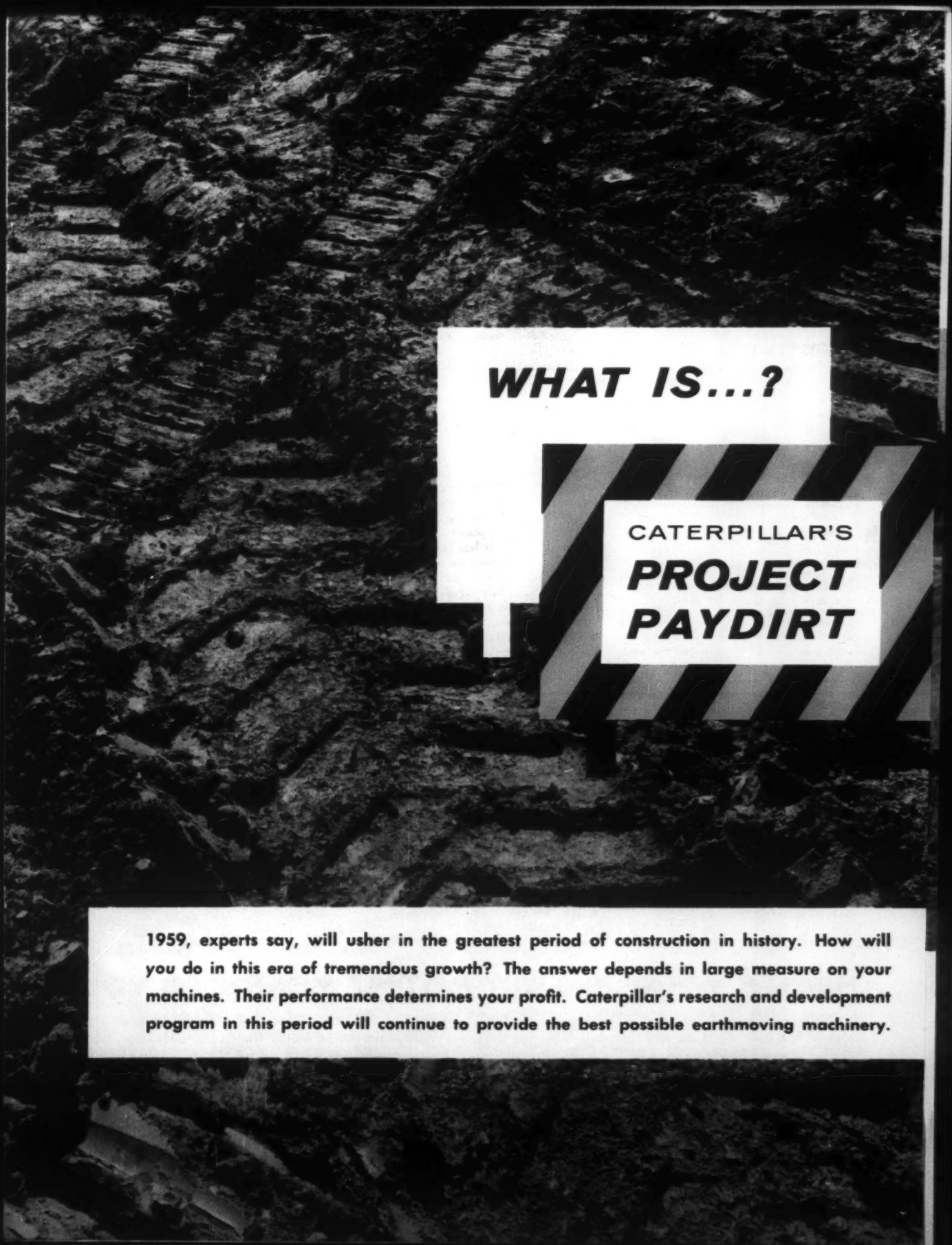
Nylined bearings—Advantages, design, specifications, cost advantages and installation recommendations for Nylined bearings, which are made of Nylon. 8 page booklet. THOMSON INDUSTRIES, INC., MANHASSET, N. Y.

50 ton capacity truck crane—Design and operating features of the Type 64-T four axle truck crane, including "pin-on" front and rear outrigger boxes, hydraulic power steering, compact rotating assembly, independent planetary boom hoist, main machinery, folding gantry and pin connected boom. 8 page catalog. CONSTRUCTION EQUIPMENT DIV., BALDWIN-LIMA-HAMILTON CORP., LIMA, OHIO.

Grating—Engineering details and description of open-floor grating and stair treads. 16 page catalog. RELIANCE STEEL PRODUCTS CO., P. O. BOX 510, MCKEESPORT, PA.

Epoxy resins—A summary of the uses of epoxy compounds and a guide to resin selection for plastic tooling, coating and adhesives, potting and impregnating. 8 page brochure. MARBLETTE CORP., 37-31 30TH ST., LONG ISLAND CITY, N. Y.

Process equipment—Process machinery for mining, chemical, stone, ceramics, water and waste applications. 8 page brochure. HARDINGE CO., INC., 240 ARCH ST., YORK, PA.



1959, experts say, will usher in the greatest period of construction in history. How will you do in this era of tremendous growth? The answer depends in large measure on your machines. Their performance determines your profit. Caterpillar's research and development program in this period will continue to provide the best possible earthmoving machinery.

CATERPILLAR'S PROJECT PAYDIRT

Project

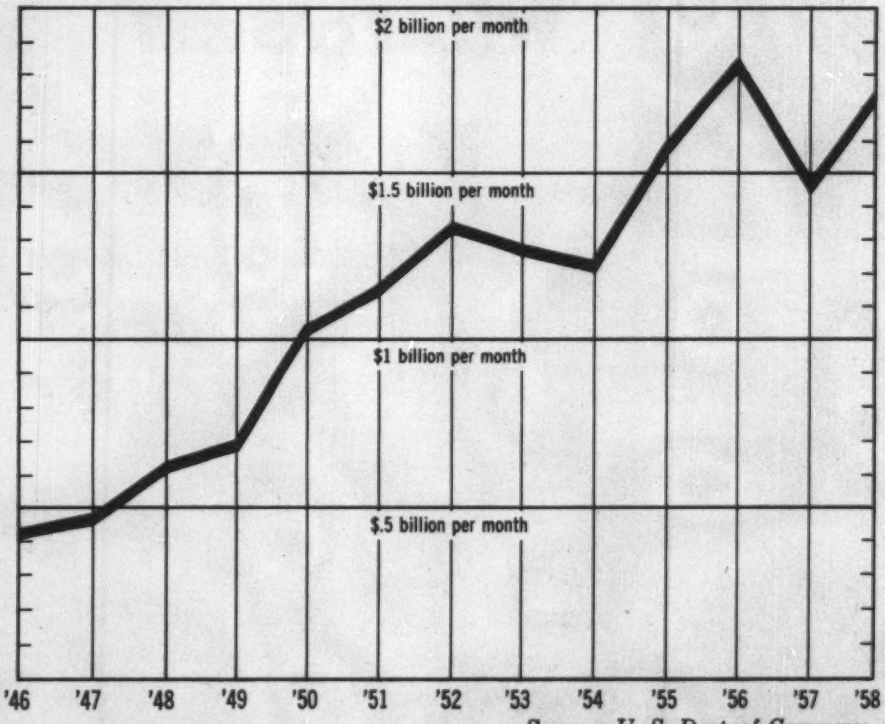
CATERPILLAR RESEARCH AND DEVELOPMENT

A multi-million-dollar research and development program at Caterpillar Tractor Co. is paying off for you in the most productive earthmoving equipment ever manufactured. It's PROJECT PAYDIRT—the big news in the construction field today.

Caterpillar research consistently has been first with the major developments in earthmoving equipment. Each development has meant more production and more profit for owners of Caterpillar machines.

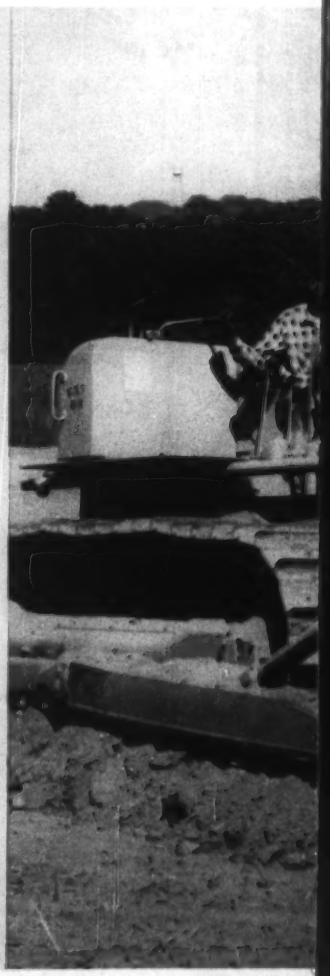
Since 1946 the money spent on heavy construction

GROWTH IN U. S. HEAVY ENGINEERING CONSTRUCTION



Source: *U. S. Dept. of Commerce*

SHARP INCREASE of money spent in U. S. on heavy engineering construction, both public and private, is shown in this graph. In 1946, a monthly average of $431 million in heavy engineering construction contracts was let. In the first eight months of 1958, contracts averaged nearly $2 billion ($1,717 million). By 1975, average monthly contracts of approximately $3.5 billion are expected.



HERE'S WHAT *PROJECT PAYDIRT* MEANS TO YOU!

As the amount of construction increases, more contractors will enter the field, and competition for the work will be intense. Machines may be the difference between profit and loss. There will be no place for anything but modern, heavy-duty machines—machines that can perform *profitably*, day in and day out, under severe conditions.

Caterpillar has these machines, a full line of quality, job-tested earthmoving equipment. And PROJECT PAYDIRT insures that the Caterpillar line will always be ready for the job ahead, regardless of changing conditions and demands. Proof of this lies in the past record.

Since the end of World War II the Caterpillar line has experienced a continuous growth. And in 1951 the DW20 and DW21 were introduced. These wheel-type tractors soon proved ideal power units for scrapers. Also from PROJECT PAYDIRT that year: the No. 90 Scraper, top producer with track-type tractors; and the HT4, a track-type, hydraulic front end loader.

The workhorse D8 Pusher, designed especially for push-loading applications, was introduced in 1953, along with

Paydirt

PACE GROWTH IN HEAVY CONSTRUCTION

in the United States has more than doubled. By 1975, experts predict, it will more than double again. Between now and then may well lie the country's greatest era of construction.

PROJECT PAYDIRT is Caterpillar's answer to the challenge of this explosive growth in heavy construction.

Money spent on heavy construction in U. S. has risen since 1946 from $5,172,000,000 to more than $20 billion. Experts predict that by 1975 annual expenditures will rise to more than $40 billion.

the No. 6 Shovel and the DW15, a smaller four-wheel tractor. 1955 brought the massive D9, king of the crawlers, equally effective as a bulldozer or for pushloading scrapers.

Also in 1955 came the three Traxcavators (Nos. 977, 955, 933), and the LOWBOWL Scrapers (Nos. 470, 456, 463), top producers that competitors still are trying to duplicate.

The Oil Clutch began setting new long-life standards in 1955. Also introduced in that year were other LOWBOWL Scrapers (Nos. 428, 435, 491), and tractor-mounted hydraulic Rippers (Nos. 4, 6, 8, 9).

In 1957, the Side Dump Bucket was offered as an attachment for the No. 955 Traxcavator, resulting in greater production through in-line loading. In the bulldozer line, the revolutionary Gyrodozer for the D7 Tractor began its career as the most versatile blade yet developed. PROJECT PAYDIRT was producing the equipment to match the growth in engineering construction.

The new Dry-Type Air Cleaner for the D9, DW20 and DW21 was introduced last month. This air cleaner removes 99.8% of all dirt in the intake air. And it requires only 5 minutes instead of the 20 formerly required to service the oil-type cleaner. That's 15 minutes more production time at each service period.

AND NOW CATERPILLAR'S PROJECT PAYDIRT BRINGS YOU...

LIFETIME LUBRICATED ROLLERS AND IDLERS

- **No routine servicing!**
- **Outwear conventional rollers and idlers!**
- **Feature new leakproof seals that can be re-used!**

Three million test hours under the toughest conditions prove this fact: new D9 lifetime lubricated rollers and idlers have no equals for low-cost, trouble-free performance.

Lubricated in the factory, they never need servicing again until they are rebuilt. They last far longer with less maintenance than conventional counterparts. Their new seals are leakproof and can be used again and again.

These outstanding advantages are the direct result of Caterpillar's new, exclusive concept in roller seal design—a metal to metal, floating ring seal.

Important as the new seal is, it is only one of many major improvements in the new D9 track roller. Major changes have also been made in rim, hub, bushing, outer sleeve bearing, roller shaft, end collars and lubrication system. These advances greatly extend roller life and effect substantial savings when rebuilding is necessary. See your Caterpillar Dealer today. He has the full story on what the new lifetime lubricated roller can mean to you.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR

Caterpillar, Cat and Tractavator are Registered Trademarks of Caterpillar Tractor Co.

BORN OF RESEARCH... PROVED IN THE FIELD

Engineering Firm Willed To Employees by Owner

Three employees of the F. A. Pease Engineering Co., Cleveland municipal planning and engineering firm, acquire ownership of the business under the terms of the will of the late Harry C. Gallimore, president of the company.

Mr. Gallimore directed that 60% of the ownership go to Frank L. Woodruff, chief engineer; 30% to Waldo B. Hecker, chief of field operations; and 10% to George C. Fenker, chief draftsman.

The firm is currently retained by 15 Cleveland suburbs. As an engineering consultant, it helped develop the suburbs of Cleveland Heights, Shaker Heights and University Heights.

Mr. Woodruff was chief deputy county sanitary engineer for Cuyahoga County from 1935 to 1941 and county sanitary engineer from 1941 to 1948. He joined the Pease firm in 1948.

Retired Highway Engineer Takes City Manager Post

William A. McWilliams, former chief engineer of the Delaware State Highway Department, has been appointed city manager of Rehoboth Beach, Del. He succeeds Lawrence I. Turner, who held the post for the past five years.

Mr. McWilliams retired from the Delaware State Highway Department after having been associated with it at various times over a period of 35 years. He served in the Army from 1940 to December 1945 and returned to Delaware to be associated with construction planning of the Delaware Memorial Bridge over the Delaware River. He was general manager of the bridge for a short time before returning to the position of chief engineer of the highway department.

Since his retirement from the highway department post he has been associated for a time with Nello Teer Company of Durham, N. C., and since 1956 with DeLeuw, Cather & Brill, engineers and architects of New York City.

Careers

Business

Lewis A. Rupp has been appointed vice president and general manager of Ionics, Inc., Cambridge, Mass. He recently retired with the rank of captain from the U. S. Navy.

Anthony J. Faranda has been appointed assistant manager of architectural sales in the New York office of Aluminum Company of America He had directed Alcoa architectural sales in the New York area from 1952 to 1957. A 1934 civil engineering graduate of Fordham University, Mr. Faranda later did graduate work at Columbia.

Manson O. Bennett, Jack L. Follett, Nathan Wilkinson, Jr., Roderick Kirkwood and **Henry A. Birner** have been made partners of John Graham and Co., architects-engineers, Seattle.

Dan M. Park is the new chief prefabricating engineer for Marshall Erdman and Associates, Madison, Wis., builders.

John B. Rutherford has opened a structural engineering office in Los Altos, Calif. He formerly was head of the structural and civil engineering department of the Western-Knapp Engineering Co, San Francisco.

Kenneth A. Thigpen, Birmingham, Ala., consulting engineer, has opened a structural design and detailing office in Orlando, Fla. **Robert H. Wallace,** an associate in the firm will represent Mr. Thigpen in Birmingham and will open his own structural engineering office in that city.

Louis F. Hewett, a former director of Merritt, Chapman & Scott Corp. and president of several New York construction firms, is now chief engineering consultant to Permagile Corp. of America, New York City plastic manufacturers.

H. H. L. Pratley will maintain the operation of his late father's firm, P. L. Pratley, Consulting Engineer, Montreal, Quebec. The firm will have the same staff but will be known as H. H. L. Pratley, Consulting Engineer.

John T. O'Rourke becomes assistant vice president of the new Anaconda Co. subsidiary, Anaconda-Jurden Associates, Inc., New York City. The new firm was recently organized for planning, designing, and engineering of industrial plants.

Norman D. Baumgard has been assigned the Portland Cement Association's newly created five-state Rocky Mountain Region, with offices in Denver.

Joel M. Morris has been named a vice-president of F. H. McGraw & Co., New York City contractor. He had been assistant to the president and chief engineer of the firm. His chief responsibility now will be new engineering and construction developments.

John F. Dunlap and **Anthony T. Rienzi** have formed the architectural firm of Dunlap and Rienzi in Philadelphia. The new firm succeeds that of Davis and Dunlap.

H. K. Fairbanks has been named consulting civil engineer to Ebasco

For True Economy... MEASURE PIPE PROTECTION WITH A CALENDAR!

Why Engineers Specify TAPECOAT ...The Quality Coal Tar Protection in Handy Tape Form for

Pipe	Tanks
Pipe Joints	Insulated Lines
Couplings	Splices
Fittings	Sprinkler Systems
Conduit	Bridge Crossings
Cables	Tie Rods

. . . in underground or under-water service

Since 1941, TAPECOAT coal tar coating in tape form has proved itself the best possible protection at lowest possible cost. Pipe and other surfaces TAPECOATED 17 years ago show no signs of deterioration—a record unmatched by any other type of tape.

Field application costs are lower with TAPECOAT because it is so easy to apply with the use of a torch. No tar kettles, technical know-how or special crews are required. TAPECOAT comes in rolls of 2", 3", 4", 6", 18" and 24" widths—sized to the job.

A TAPECOAT sales and service engineer is available at all times to assist you on any corrosion problem and on the various applications of TAPECOAT.

Write for illustrated brochure.

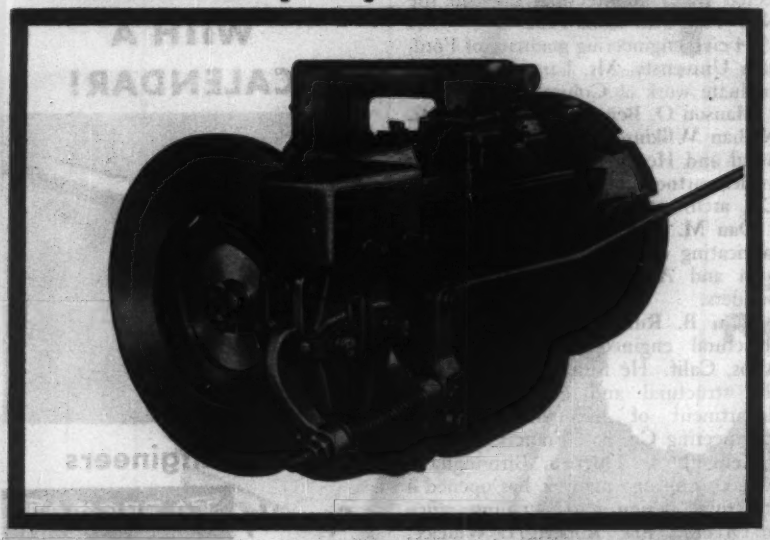
The **TAPECOAT** *Company*

Originators of Coal Tar Coating in Tape Form

1551 Lyons Street
Evanston, Illinois

Representatives in Principal Cities

You Get Positive Protection Against Runaway or Parking Accidents When You Specify TRU-STOP Brakes



TRU-STOP brakes operate directly on the drive shaft. This means that they are not only excellent parking brakes, but dependable emergency service brakes as well. There's no dangerous self-energizing. TRU-STOP brakes have the surplus capacity for repeated use as an auxiliary to service brakes.

100% Ventilation Minimizes Fading

Brake efficiency depends on ability to dissipate heat rapidly and so prevent fading. TRU-STOP brakes are 100% ventilated. Discs are exposed to air even while braking. The TRU-STOP ventilation system circulates air *between* the disc plates.

Longer Life with Uniform Brake Pressure

The discs of TRU-STOP brakes are squeezed between the flat surfaces of the shoes. The brake lever operates both the front and rear lever arms simultaneously, and pressure is exerted on the center of each shoe. This puts the entire lining surface in contact, provides for even wear. TRU-STOP brake linings are *easy* to replace.

FOR POSITIVE PROTECTION...

Specify TRU-STOP BRAKES on ANY Heavy-Duty Equipment that Requires Braking

WRITE for Catalogs DH-33 and DH-530

Automotive and Aircraft Division

AMERICAN CHAIN & CABLE

ACCO

601 Stephenson Bldg., Detroit 2
2216 South Garfield Ave., Los Angeles 22 • 929 Connecticut Ave., Bridgeport 2, Conn.

Services, Inc., New York City. H. W. Stuber is new chief concrete-hydraulic design engineer and A. T. Larned becomes an associate consultant in the consulting engineering division.

William Dudley Hunt, Jr., and **James Travis Dent**, architects, have formed a partnership with offices in New Orleans, La., and Pensacola, Fla.

Henry W. Fischer, Egbert R. Hardesty, and **John J. Fiala** have been admitted to the New York City consulting firm of Hardesty and Hanover as partners.

W. D. Painter is a partner in the consulting engineering firm of Clark, Daily and Dietz. He will remain as project engineer in charge of their Memphis, Tenn., office.

H. Velpeau Darling has joined Transportation Consultants, Inc., Washington, D. C., as vice president.

J. Alan Myers was elected vice president of engineering for Lane Pipe Corp., Bath, N. Y.

Edmund W. Hollister has been appointed assistant manager of The Austin Co.'s 14-state Cleveland district. He has been with the firm since 1940.

Raymond H. Cummings, veteran of 18 years with the Dallas, Tex., building inspection division has been appointed its chief. He replaces **C. A. Farrell** who has retired from municipal employment. Mr. Farrell had been chief inspector since 1946.

Public Works

Melbourne H. West, assistant planning survey engineer, has been appointed engineer of city and cooperative projects for the California Division of Highways. He succeeds **Clarence E. Bovey**, who is retiring after 44 years with the highway department.

Dale Mills, city engineer of Albemarle, N. C., has resigned to accept an engineering post with the city of Gastonia, N. C.

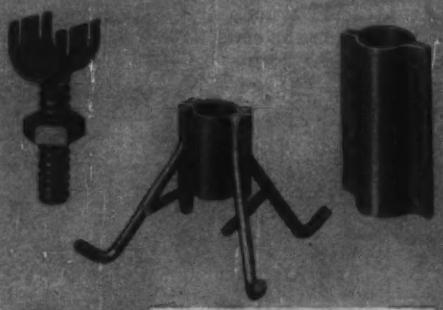
Frank C. Mohler, former chief hydraulic engineer for the Ohio Division of Water at Columbus, has been named chief hydrologist of the Florida Department of Water Resources at Tallahassee.

Michael J. Kopeski has resigned as project supervisor for the Providence Redevelopment Agency to become executive director of the Putnam, Conn., Redevelopment Agency.

Louis C. Stockmeyer has been appointed city manager of Oregon City, after a 24-year career as city engineer.

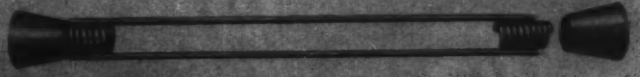
Thomas Basich, manager of Gill Asphalt Co., Toledo, has been named Commissioner of Streets for the city.

(*Men and Jobs continued page 70*)



HEAVY-DUTY SCREED SUPPORTS

Overpasses and Underpasses

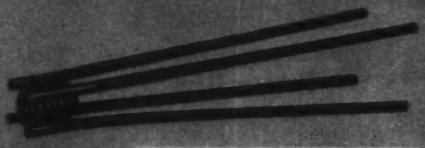


THREADED COIL TIES

Engineering Structures

TILT LOCK CLAMPS

Heavy-Duty Forming



4-STRUT COIL ROD ANCHORS

Temporary or Permanent Anchorage

SUPERIOR

One Source For All Accessories For Dependable Concrete Forming

These are examples of the numerous types of form ties, anchors, inserts, and other items in Superior's most complete line of concrete accessories. The illustrations show the variety of concrete form work and related jobs in which Superior accessories are used. All items are designed to provide the most dependable and efficient forming methods.

WHENEVER YOU ARE PLANNING FORM WORK... Superior's technical assistance is available to prepare suggested layouts. Call or write to nearest address shown below.

SUPERIOR CONCRETE ACCESSORIES, INC.

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1775 Broadway
New York 19, N. Y.

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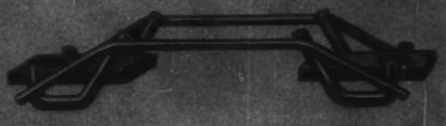
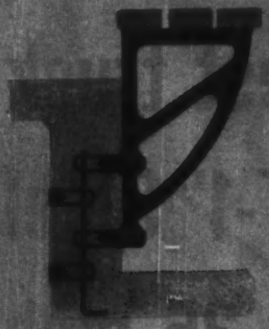


PLATE HANGER FRAMES

Bridge Superstructures

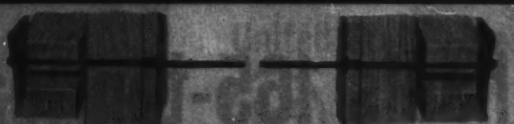


RISER-FRAMES

Stadiums and Grandstands

PICK-UP INSERTS

Tilt-Up Work



SNAP TIES

Ordinary Foundations

World's biggest dump truck is made with "T-1" Steel. Hubert Everist, Equipment Manager for Western Contracting Corporation, conceived the idea for the truck and had it designed by Charles W. Jones Engineering Co. of Los Angeles. Fabricators of box and frame: Eaton Metal Products Corporation, Omaha, Nebraska.

World's biggest truck made with USS "T-1" Steel hauls 165-ton loads at 35 mph

Reaches 45 feet into the air. Over-all width is 15½ feet; height 14 feet. Hauls 80 cubic yards struck or 110 yards piled. USS "T-1" Steel gives it extra strength and high resistance to impact abrasion.

YOUR FIRST impulse is to dive for the ditch when you see this mastodon of trucks roaring down the haul road at Oahe Dam near Pierre, South Dakota. But if you're a contractor, you figure that a whale of a lot of dirt is being moved in a mighty short time. That's exactly what the Western Contracting Corporation of Sioux City, Iowa wanted to do. They hold the contract for moving some 24,500,000 cubic yards of earth and rock at Oahe—the largest rolled earth dam in the world.

Western decided to "shoot the works" and build the biggest possible dump truck. It is an 18-wheel, 750-hp semi-trailer that is currently hauling a payload of 110 yards or 165 tons.

25% lighter. To get this high capacity with the least weight, they built the box and frame of USS "T-1" Constructional Alloy Steel. "T-1" Steel had a minimum yield strength of 90,000 psi but is now available at 100,000 psi. Western estimated it saved 12½ tons in dead weight or 25% of the trailer's weight.

Good fabricating properties. Because USS "T-1" Steel can be readily formed and welded, all members could be built up from plates. Reinforcing for the box was formed into channels through which exhaust gases are piped to keep the load from freezing in cold weather.

High resistance to impact abrasion. Dumping a 165-ton load in a few seconds causes terrific impact abrasion. "T-1" Steel is noted for its ability to take this kind of punishment and gives much longer service than ordinary steel.

Write for free booklet on USS "T-1" Steel. Address United States Steel, Room 2801, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS and "T-1" are registered trademarks

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

United States Steel

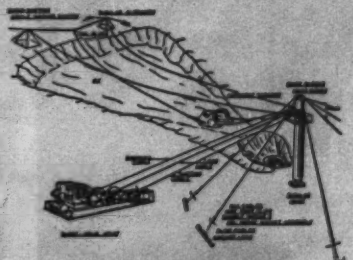
USS

Profitable Bulk Material Handling Starts with a Sauerman DragScraper

digging *and hauling to plant*

This digging and hauling operation is being handled with a 3-yd. DragScraper.

This 2-yd. DragScraper is dumping river gravel dug from 50 ft. of water into grizzly feeding conveyor to plant. *See Sauerman News No. 147.*



● **THE SAUERMAN METHOD**—*showing a basic DragScraper installation. Variations of this method are Sauerman engineered to handle the toughest digging jobs at the lowest cost per cu. yd.*

A Sauerman DragScraper handles the two basic steps of material flow—digging and hauling—in one continuous operation. No double handling is required. You cut labor costs in half—or even more—because a single machine, controlled by one man, replaces the multiple equipment required by other methods.

Profitable handling is further assured by a maintenance cost of only 1½ cents per cu. yd. for the average size Sauerman installation. On larger machines, the increased volume drops this cost still lower. You'll save money on power, too, by eliminating heavy machinery with limited handling-to-dead weight capacity. You pay only the cost of moving the actual digging tool—a Crescent DragScraper.

The best Sauerman Machine for your plant is governed by the nature of the deposit, location of material, depth and plant layout. DragScraper machines in sizes from ⅓ to 15 yds. provide delivery at the lowest cost per cu. yd.

Why not consult Sauerman engineers about your plant? Their recommendations will be based on almost fifty years of materials handling and excavating machinery experience. Ask for Catalog A (DragScrapers).

SAUERMAN BROS., INC. 632 SO. 28th AVE. BELLWOOD, ILL. Cable: CASEX—Bellwood, Ill.

. . . Men and Jobs

He has been with Gill Asphalt for five years. He had also been a field engineer for A. L. Bentley Co., Toledo.

Lt. Col. Miles L. Wachendorf, assistant engineer for civil works, Corps of Engineers, New England District, has been put in charge of construction at Sonderstrom Air Force Base, Greenland, and at various other sites. The work is extending the Distant Early Warning Line.

Col. Carlin H. Whitesell is District Engineer for the Army Corps of Engineers' Eastern Ocean District. He will head the District's 1958 $190 million construction program.

Byron Bird has retired as chief engineer for the Washington, D. C., district of the Corps of Engineers. He concludes a 47 year career in engineering and teaching, including 22 years as an engineer in the Washington district.

Col. Charles C. Noble was appointed district engineer for the Corps of Engineers' Louisville District.

Charles F. Beatie, project engineer for the Corps of Engineers, will retire at the end of the year.

Lt. Col. Robert G. McCall has been appointed assistant chief of the Army's Medical Service Corps and chief of the Sanitary Engineering Section.

Lieut. Col. Thomas F. Spencer has been asisgned to Keflavik, Iceland, as Area Engineer for the New York District, Corps of Engineers. He previously commanded the 79th Engineer Group (Construction) at Fort Belvoir, Va.

Education

John N. Cernica is new head of the civil engineering department at William Rayen School of Engineering, Youngstown University. He has been acting head of the department since last fall.

Earl I. Brown II, is the new assistant dean of the School of Engineering at Alabama Polytechnic Institute. He had been head of the civil engineering department. He has taught at North Carolina State College and Georgia Institute of Technology.

Reginald F. Malcolmson has been appointed associate professor and acting director of the department of architecture at Illinois Institute of Technology. He succeeds **Ludwig Mies van der Rohe**, who retired. A native of Ireland, Mr. Malcolmson practiced architecture there until coming to IIT in 1947 for further study. He became a member of the faculty in 1949.

Nelson Nemerow was appointed professor of civil engineering at Syracuse University.

Russell C. Brinker has been appointed professor of civil engineering at Texas Western College, El Paso.

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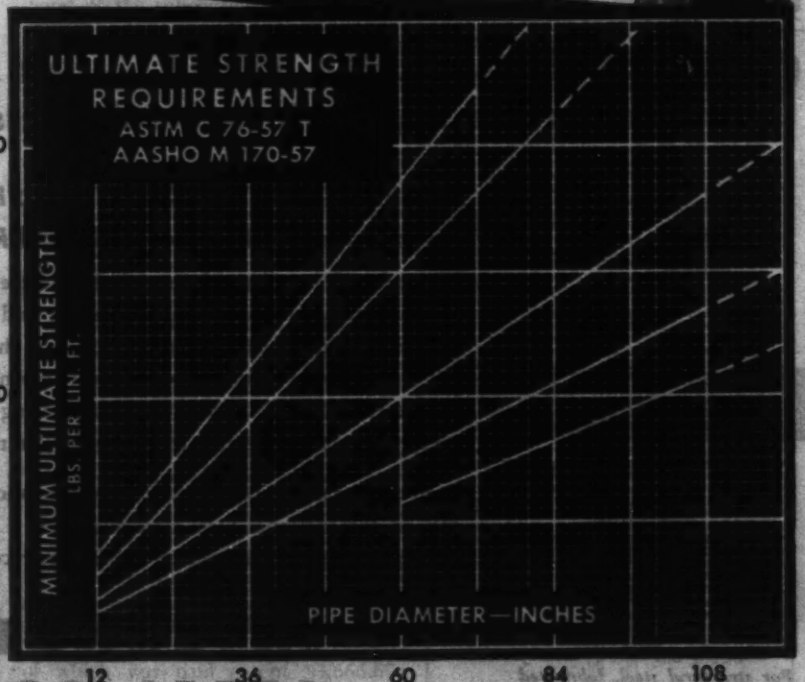

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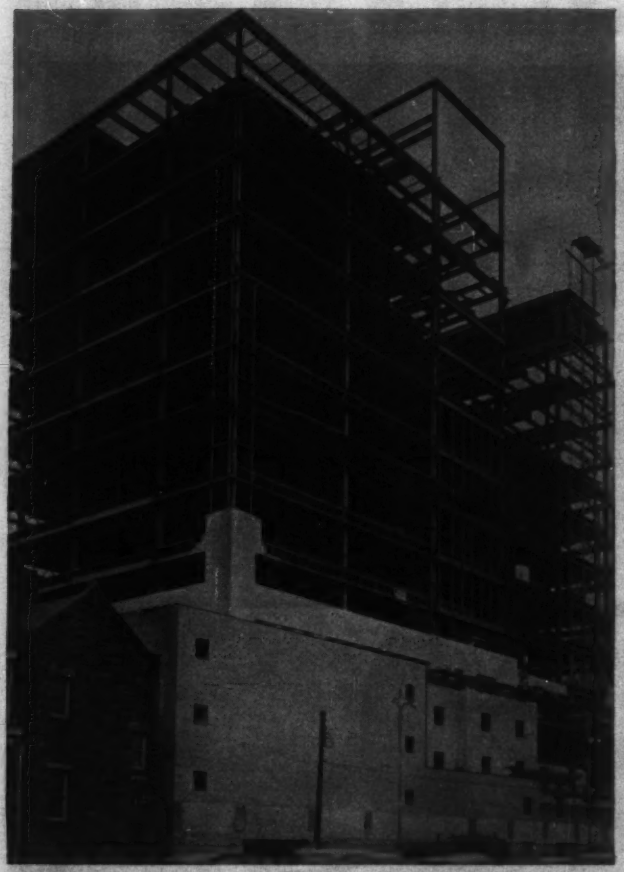

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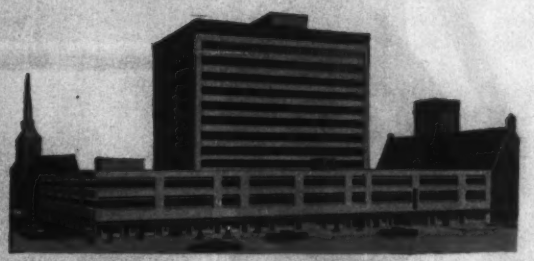

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Architects: Lorenz & Williams

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Performance Bond

A sub's bond protects general against claims by sub's materialmen

A prime contractor who is forced to pay for materials furnished a subcontractor can seek reimbursement from the surety that furnished the sub's performance bond.

A federal court, in explaining the rule, has said the sub's nonpayment is a breach of contract that invokes the surety's liability.

The case arose under North Carolina law and had this factual background:

Wright Contracting Co. entered into a contract with the North Carolina State Highway and Public Works Commission to do certain road construction work and furnished a payment bond as required by North Carolina law. Wright entered into a contract with Lincoln Contractors, Inc., whereby the latter was to do certain hauling work required by the prime contract. The subcontractor furnished a performance bond.

Shortly after the subcontract was entered into, the subcontractor became bankrupt and Wright was required to pay certain claims for materials furnished the subcontractor. The amount paid was $12,707.81. Wright then brought an action against the subcontractor's surety to recover the amount paid to the parties who had supplied materials to the subcontractor. The surety contended that the performance bond was only to secure performance of the work and did not cover payment for supplies furnished the subcontractor or any loss sustained by Wright by reason of the failure of the subcontractor to pay for the materials. The trial court granted judgment to Wright and the judgment was affirmed on appeal.[1]

The appellate court stated: "We think that the court below was correct in holding that plaintiff's (Wright's) loss was covered by the bond. Even if it be construed as guaranteeing nothing more than the performance of the subcontract, it is perfectly clear that the subcontract has been breached and that plaintiff's loss resulted from the breach. The subcontractor agreed to furnish and supply all labor, equipment, fuel, tools, supplies and any and all other facilities whatsoever necessary for doing the hauling covered by the subcontract. This unquestionably meant to furnish and supply them without liability on the part of the prime contractor to pay for them; and there was a breach of the agreement when there was failure to furnish them in such a way as to protect the prime contractor from such liability. Under the North Carolina statute and the bond given by the prime contractor pursuant thereto, the prime contractor was bound to pay for supplies used on the project including those furnished to and used by the subcontractor if the latter failed to pay for them; and the subcontractor did not furnish the supplies within the meaning of the subcontract when it merely bought and used them, leaving them to be paid for by the prime contractor. Seaboard Surety Co. v. Standard Accident Ins. Co., 277 N.Y. 429, 14 N.E. 2d 778, 118 A.L.R. 658 and note. . . . The general rule is thus stated in 43 Am. Jur. page 896; 'As a general rule it may be stated that if the subcontractor's bond is conditioned for the indemnification of the contractor for any claim or damage for which the principal contractor may be held liable and for the payment of which the subcontractor is primarily liable, liability exists on the part of the surety on the bond of the subcontractor against any liability which may be imposed upon him, or to reimburse him for any payment he may be required to make, in respect of labor and materials furnished to the subcontractor.'"

(1) Saint Paul Mercury Indemnity Co. v. Wright Contracting Company, 250 F. 2d 758, U.S. Court of Appeals, Fourth Circuit, Jan. 6, 1958.

Breach of Contract

Owner must mitigate the damages after contractor defaults in performance

When a contractor defaults in the performance of his work and the owner claims damages because he had to complete the work at his own expense, the owner cannot aggravate the damages.

In a Pennsylvania case, a contractor brought an action to recover the amount it claimed was due on a contract to erect a manufacturing plant. The contract price was $154,000 all of which was paid except $3,666.67 evidenced by four promissory notes signed by the owner.

At the trial, the owner produced evidence to show that it had spent $4,700 to complete the unfinished work called for by the contract. The court brought in a verdict in favor of the owner for

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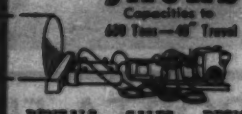

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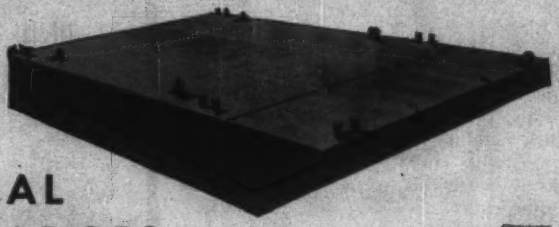

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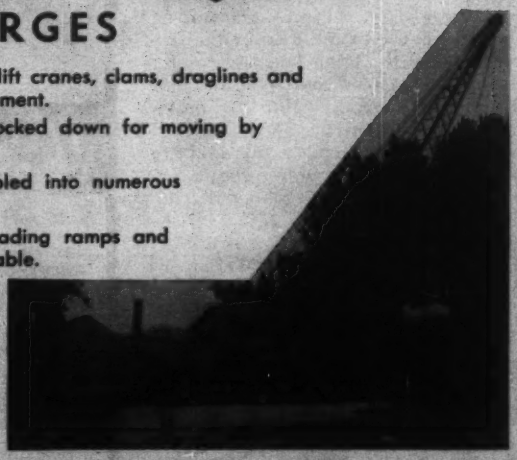

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such excess cost. This judgment was reversed on appeal[1] and a new trial ordered on the ground that the work was completed four years after the contractor abandoned the job during which period construction costs had gone up.

The court considered it the duty of the owner to complete the work promptly.

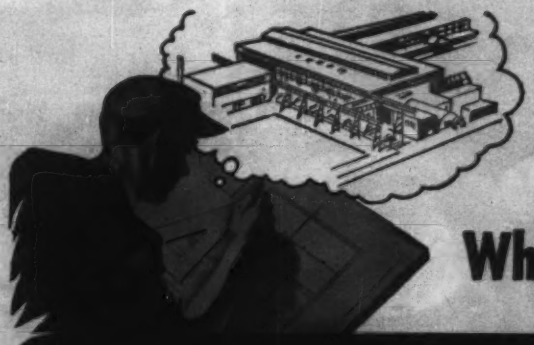
As a matter of law, it said, damages must relate to the time of breach.

The appellate court stated: "When a building contractor has neglected to perform his contract in every respect, it is the duty of the owner to mitigate the damages resulting from the unfinished work which the contractor failed to perform. Taber v. Porter-Gildersleeve Co., 271 Pa. 245, 114 A. 773. The rule that one cannot recover damages from a defaulting party which could have been avoided by the exercise of reasonable effort is applicable to construction contracts. In Henry Shenk Co. v. Erie County, 319 Pa. 100, at page 109, 178 A. 662, at page 666, it is said: 'The rule (avoidable consequences not recoverable) may be applicable in any case of breach of contract. Where damages are claimed, not for direct injury, that is, the loss of the value of the contract itself, but for a consequential loss, the plaintiff cannot recover for such loss if he might reasonably have avoided it. Since the early New York case of Clark v. Marsiglia, 1 Denio, N.Y., 317, practically all American jurisdictions recognize and adopt the rule. Chamberlin v. Morgan, 68 Pa. 168; Hoffman v. Delaware, etc., R. Co., 39 Pa. Super. 47.'"

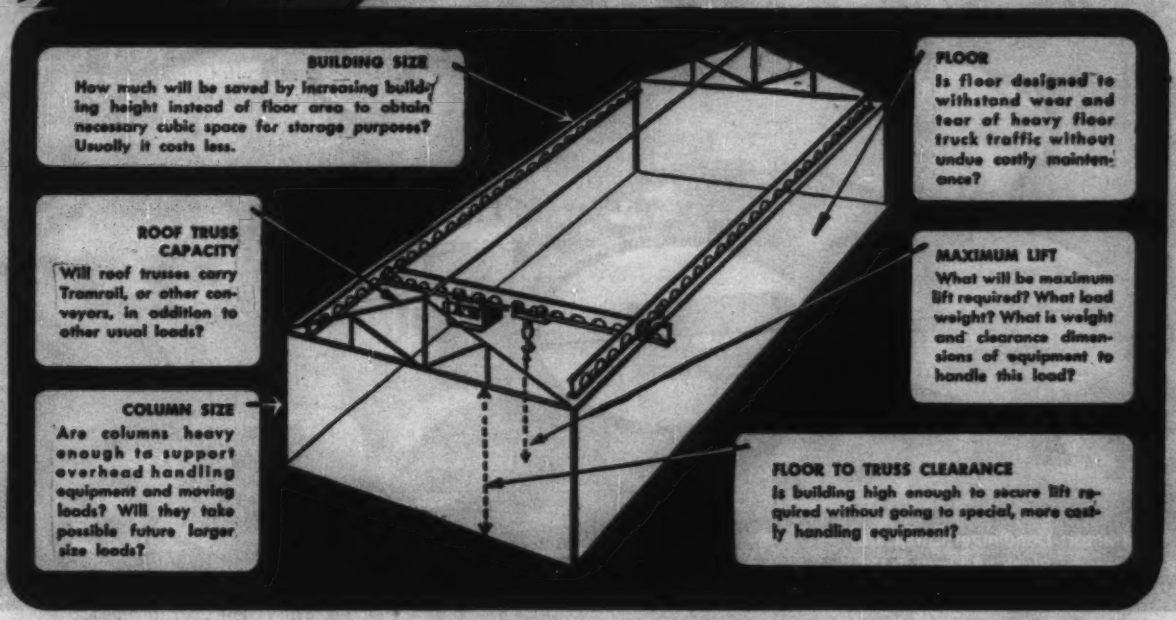
The court held that the contractor would only be required to pay what it would cost to complete the work at the time of the breach and not what it did cost four years later. "As a general rule, the damages upon breach of a contract are to be measured as of the date of the breach. 15 Am. Jur., Damages, Section 50."

(1) Gaylord Builders, Inc. v. Richmond Metal Manufacturing Corp., 140 A. 2d 358, Superior Court of Pennsylvania, April 16, 1958.

These summaries of court decisions are prepared by I. Vernon Werbin, Esq., New York attorney and licensed professional engineer, who is author of the following books published by McGraw-Hill Book Company, Inc.: *Legal Phases of Construction Contracts; Legal Guide for Contractors, Architects and Engineers;* and *Legal Cases for Contractors, Architects and Engineers.*



Don't Forget *Materials Handling* When Designing the Building


BUILDING SIZE
How much will be saved by increasing building height instead of floor area to obtain necessary cubic space for storage purposes? Usually it costs less.
ROOF TRUSS CAPACITY
Will roof trusses carry Tramrail, or other conveyors, in addition to other usual loads?
COLUMN SIZE
Are columns heavy enough to support overhead handling equipment and moving loads? Will they take possible future larger size loads?
FLOOR
Is floor designed to withstand wear and tear of heavy floor truck traffic without undue costly maintenance?
MAXIMUM LIFT
What will be maximum lift required? What load weight? What is weight and clearance dimensions of equipment to handle this load?
FLOOR TO TRUSS CLEARANCE
Is building high enough to secure lift required without going to special, more costly handling equipment?

The foremost demand of a new factory building, whether for production or storage, is that its design and construction aid overall operating efficiency to the utmost. Thus, the building becomes more than just an enclosure, but is actually a vital part of the manufacturing process.

It is, therefore, imperative that the various steps entering into the making of an item be thoroughly considered when the building is designed. One of the most important of these concerns materials handing because this item often amounts from 25% to 50% of the total production cost, and, also, because it is plant-wise in nature.

Regardless of what handling methods are deemed best, overhead cranes or Tramrail, roller or chain conveyors, floor trucks, etc., the building design, size and construction usually has a tremendous bearing on the ultimate handling efficiency secured. Building clearances, floor construction, column locations, aisleway allowances and other factors must be considered for the different handling methods for most satisfactory results.

For initial economy in installation, for most satisfactory operation and highest efficiency, plan for materials handling when you design the building. ***Do not make materials handling an afterthought.***

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Books

Drafting Text Improved

TECHNICAL DRAWING—Fourth edition, by F. E. Giesecke, A. Mitchell and H. C. Spencer. 844 pp. The Macmillan Co., New York, N. Y. $10.

Those who have been using "Technical Drawing" as a text and reference work on drafting will be pleased to learn that it is improved in new edition. The fourth edition is a thorough revision; few of the original illustrations and little of the original text remain.

Adoption of a larger format is an important basic improvement. It enables use of larger illustrations, which are easier to study.

In the revision, the authors utilize the latest American Standards, including the various sections of ASA Y14, American Drafting Standards Manual. Heavy emphasis is also placed on freehand sketching.

The chapters on Structural Drawing and Topographic Drawing have been revised by Prof. E. I. Fiesenheiser, Illinois Institute of Technology. And in line with current trend toward greater use of graphics, the chapter on Graphs has been rewritten and a new chapter on Engineering Graphics has been added.

History of Technology

MAN THE MAKER—by R. J. Forbes. 365 pp. Abelard-Schuman, Inc., 404 Fourth Ave., New York 16, N. Y. $5.

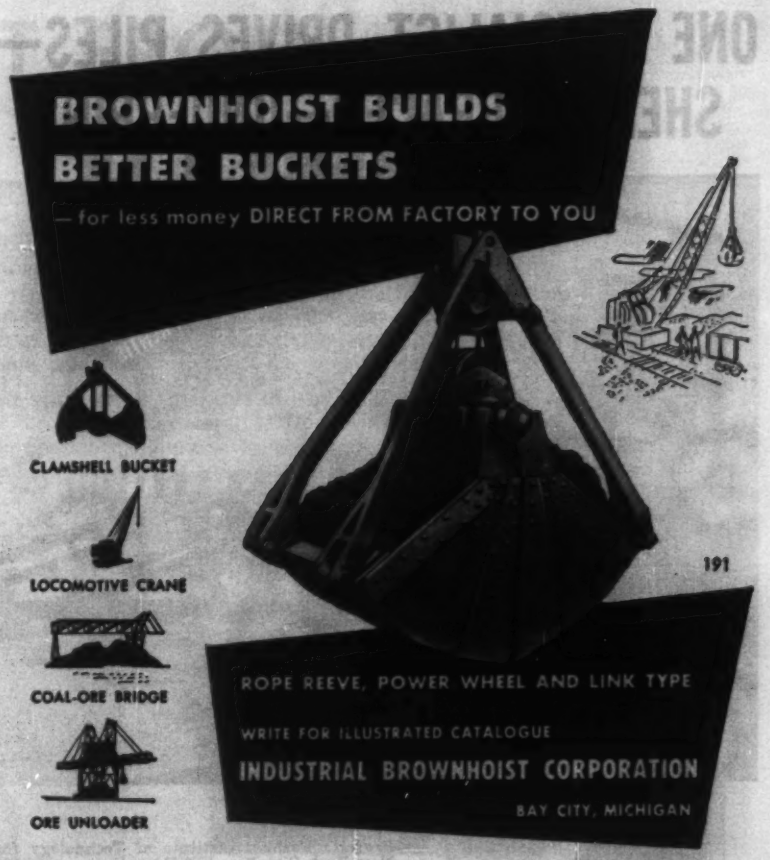
The history of technology and engineering is traced from its beginning to the present. The book is an effort to show the importance of man's development as a tool-using animal. The causes and consequences of technological progress are related to the cultural economic and political development of mankind. The relationship of inventions of prehistory to those of the modern era are examined, as are the relationships of the inventors to each period.

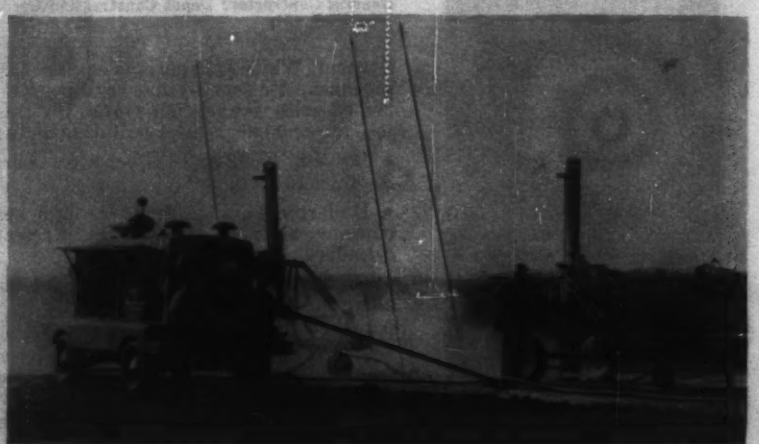
Text on Structural Theory

THEORY OF STRUCTURAL ANALYSIS AND DESIGN—By James Michalos. 552 pp. Ronald Press Co., New York, N. Y. $12.

Though intended primarily as a textbook, this volume will also be valuable as a reference work on analysis of statically indeterminate structures. It covers continuous beams and frames, arches, space frames and curved girders.

From the beginning, the author tries to encourage an understanding of the behavior of structures. He does this by showing how to sketch the deflected position of structures under load and





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bending-moment diagrams, before he goes into the mathematics for calculating deflections and moments.

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Miscellaneous Notes . . .

• **Airports**—A Development Guide for Domestic Airport Terminal Passenger Facilities, based on a one year study of airport terminal needs, may be obtained from Air Transport Association of America, 1,000 Connecticut Avenue, N.W., Washington 6, D.C at a charge of $1.00.

• **Successful Contracting**—So You Want To Be A Successful Contractor is a guide to the basic principles of contracting. Three of its sections are devoted to: the contractor and the bonding company; bank standards for successful contracting; and the contractor and his accountant. The 40-page pamphlet was prepared by the Industry Wide Committee of Texas A.G.C. For copies write Texas Association of General Contractors, Executive Council, P.O. Box 43, Austin 61, Texas. 25 cents per copy.

• **Where taxation spurs construction**—A picture survey showing how low taxes on improvements and high taxes on land values stimulated construction in cities of Australia, New Zealand, South Africa and western Canada where this system of taxation is used. Prepared by the International Research Committee on Real Estate Taxation, under Canada's H. Bronson Cowan, and available for $3 a copy from Harper & Bros., 49 E. 33rd St., New York 16, N. Y.

• **Accident prevention**—Reprints from the Manual of Accident Prevention in Construction include sections on scaffolding and ladders in Booklet A, and sections on explosives and power actuated tools in Booklet B. Copies may be obtained for 15 cents each from Associated General Contractors of America, Inc., 20th and E Streets N.W., Washington 6, D. C.

• **Scientific activities**—In this 62 page report on "Scientific Activities in Six State Governments", the National

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Photographs courtesy of Department of Highways of the County of Cook, Illinois, and the Division of Highways, State of Illinois.

Workmen placing reinforcing bars in floor slab of Little Muddy Creek Bridge near Clay City, Illinois.

Reinforced concrete deck girder grade separation at 130th Street over Doty Avenue, Chicago, Illinois.

One of the outstanding applications of steel reinforcing bars in Illinois is this experimental, continuously reinforced concrete pavement which was constructed on U. S. Route 40 near Vandalia, Illinois.

Workmen pouring concrete on steel reinforcing bars—Torrence Avenue Bridge spanning three sets of railroad tracks in Chicago, Illinois.

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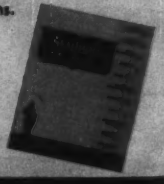

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. . . Books

Science Foundation took California, Connecticut, New Mexico, New York, North Carolina and Wisconsin as representative of major geographical regions in the U. S. A section is included on resource development and public works. The report may be obtained for 40 cents from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

• **Hydraulic Research in the United States 1958**—This latest in a series of annual publications dating back to 1951 contains reports on hydraulic research conducted within the past year in the U. S. and Canada. It serves as a guide in the co-ordination and planning of hydraulic research and is a contribution to a broad effort to avoid duplication of research in the field. The information is compiled from reports by various hydraulic and hydrologic laboratories in both countries. National Bureau of Standards Miscellaneous Publication 224, edited by Helen K. Middleton. 168 pp., Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., $1.25.

• **Soil-cement**—A concise, easily read booklet deals with this base material for road, street and airport pavement. The booklet starts with a definition of soil-cement, its history and uses. Other parts discuss engineering properties, materials and controls. Final section shows how soil-cement is built and proper inspection and field control. Titled, "Essentials of Soil-Cement," it is put out by the Portland Cement Association, 33 W. Grand Ave., Chicago 10, Ill.

• **Recorded rain**—Storms are duscussed in detail with relation to previous rainstorms studied by the Water Survey since 1948. Mathematical relations useful to design engineers, hydrologists and agriculturists are given. Entitled "Hydrometeorological Study of Severe Rainstorms in Illinois, 1956-1957, With Summary of Previous Storms," the report is available from State Water Survey, Box 232, Urbana, Ill.

• **Water resources**—Contains run-off data for the climatic years 1954-55 and 1955-56 for the Atlantic drainage, which comprises the provinces of New Brunswick, Nova Scotia and Newfoundland. Includes a short description of the organization and scope of operations, an explanation of the method of tabulation and 145 pages of streamflow and water-level data for a number of rivers, streams and lakes in the drainage area. Water Resources Paper No. 120, Director, Water Resources Branch, Dept. of Northern Affairs and National Resources, Ottawa 4, Canada, $1.50.

Highway Prices—District of Columbia

Average of Range of Contract Prices, 1958—1st Half

Bid Awards, 1958—1st half

Items	Unit	No. Jobs	Unit Prices Avg.	Range
Bridge				
Exc, unc	cy	1	$1.25	$ ..... $ .....
structural	cy	2	5.48	3.20- 9.75
Backfill & fill	cy	2	2.93	2.80- 3.05
Dampproofing	sy	2	1.09	1.00- 1.17
Membrane waterproofing	sy	2	4.33	3.00- 5.65
Porous backfill	cy	2	5.50	5.00- 6.00
Conc, cl BB,				
subfoundatn	cy	1	28.50	....
footing	cy	2	35.20	33.65- 36.75
wall	cy	1	55.90	....
pier	cy	1	35.00	....
superstruct	cy	2	69.75	59.75- 79.80
appr slab	cy	1	35.00	....
Reinforcing steel	lb	2	0.151	0.147 0.155
Struct carbon steel	lb	1	0.295	....
low alloy steel	lb	1	0.232	....
Test piles	lf	1	16.00	....
Treated timber piles	lf	1	3.68	....
Conc piles, cast in pl	lf	1	4.35	....
Stone masonry facing	sf	2	6.30	6.00- 6.60
dimensioned	cf	1	17.85	....
Fabric pads, preformed	sf	1	8.00	....
Waterstop, type 1	lf	1	2.00	....
2	lf	1	3.00	....
Roads				
Exc, ordinary	cy	14	1.44	0.33- 4.00
hard surface	cy	12	3.05	0.75- 5.00
hand	cy	12	10.53	5.40- 12.80
macadam or old mail	cy	3	1.16	0.33- 2.40
Borrow, embankments	cy	15	2.71	1.45- 4.00
soil base	cy	3	3.18	2.00- 3.85
Overhaul, ¼ mile	cy	5	0.05	0.01- 0.10
Scarifying	sy	4	0.76	0.50- 1.00
Soils base crse, 12" deep	sy	3	1.04	0.95- 1.05
Interceptor drains, 6"	lf	5	1.25	0.80- 2.50
8"	lf	2	2.12	0.60- 3.75
Additional trench exc	cy	7	3.13	1.00- 8.00
Connecting pipe, 6"	lf	6	1.39	0.60- 3.00
8"	lf	7	2.43	0.75- 5.00
Borrow for trench bkfl	cy	7	3.21	1.80- 6.83
Lumber left in place	Mbf	8	80.25	40.00-100.00
Reinf port cmt conc pave	cy	14	29.64	12.50- 65.00
6"	sy	3	5.48	4.75- 6.80
8"	sy	11	6.73	6.15- 8.00
Add 50/ wire fab reinf	sy	14	0.65	0.48- 1.00
expansion jt filler	lf	6	1.20	0.40- 3.00
standard cement	bbl	8	5.04	4.30- 5.80
Cal chloride for acceler	lb	14	0.04	0.02 0.06
Reinf port cmt conc base	sy	8	5.95	5.75- 6.35
	cy	11	23.73	14.50- 29.00
Port cmt concrete,				
drwy & alley entrs, 6"	sy	4	5.80	4.80- 6.80
7"	sy	11	6.81	5.60- 7.60
sidewalk	sy	11	4.48	3.77- 5.10
repair	sy	14	5.25	4.00- 7.00
curb, tp A, 18"	lf	6	1.97	1.00- 3.00
var width & depth	cy	6	39.75	13.50- 65.00
comb curb & gutter,				
tp A	lf	12	3.09	2.50- 3.80
gutter	sy	15	7.97	5.00- 11.80
bus stops, cl A	cy	2	65.25	62.50- 68.00
Add expans jt fill, sidew	lf	14	0.42	0.15- 0.70
alleys & drwys	lf	14	0.57	0.30- 0.75
Port cmt conc, bits, cl B	cy	3	56.67	45.00- 70.00
Pave & sidew repair	cy	5	5.40	4.00- 7.00
Brick sidew, rep or repl	sy	5	2.40	1.00- 4.00
Cut to neat line	lf	10	0.82	0.10- 2.00
Anchor bolts	ea	4	2.88	2.00- 4.00
Stn curb set, 8x12", str	lf	3	2.08	1.50- 2.75
curv	lf	11	3.02	1.50- 4.00
reset, 8x 8", str	lf	2	2.38	2.00- 2.75
8x12", str	lf	5	2.25	1.00- 3.00
curv	lf	3	2.92	2.75- 3.00
reset str or crv				
8x8", 8x12", 6x20"	lf	11	3.03	2.00- 5.00
Stn or conc curb, str or				
curv adj	lf	3	0.83	0.50- 1.00
Curb flashed to DC yard	lf	13	0.80	0.10- 1.85
DC MH frames & catch				
basin covers adj	ea	14	7.32	4.00- 15.00
Wat vlv frame cups adj	ea	7	5.64	5.00- 8.50
PUC MH frames,				
under 6 sf adj	ea	11	3.36	1.00- 10.00
6-15 sf adj	ea	5	2.60	1.00- 7.00
over 15 sf adj	ea	5	2.60	1.00- 7.00
Sht asph pave, incl asph				
conc binder	sy	3	1.93	1.80- 2.10
mod	sy	2	1.78	1.70- 1.85
Asph conc binder	t	3	13.82	12.50- 15.00
mod	t	7	12.43	10.00- 15.00
Sht asphalt surf	t	7	15.93	10.00- 21.00
Asph conc base, cl A	t	15	11.03	7.75- 15.85
surf, cl C, w/temp fluid	t	14	13.00	10.00- 18.00
surf, cl D	t	7	10.42	7.95- 14.00
Asph surf by heater				
method repair	t	2	25.80	25.00- 26.00
Asph conc surf, cl D				
heater	t	2	24.40	23.80- 25.00

Sewer Items

Items	Unit	No. Jobs	Unit Prices Avg.	Range
Port cmt conc, cl B, for				
walls, steps & copings	cy	15	$80.73	$15.00-$95.00
Topsoil, 4" deep	sy	8	0.58	0.40- 0.75
Stone masonry walls	cy	4	80.00	70.00- 90.00
S&W MH frames & cov-				
ers, furnish	ea	5	48.80	34.00- 55.00
Port cmt conc curb				
reinf circ	lf	5	2.68	2.10- 3.50
recessed	lf	2	1.65	1.10- 2.20
reinf curb & gut, circ	lf	7	3.79	3.55- 4.25
Water valv casings, old				
style, replaced	ea	6	22.25	20.00- 25.00
Adapter rings, head & set	ea	5	1.40	1.00- 3.00
Cmt conc str curb, alley				
& driveway corners	lf	14	2.90	1.10- 4.00
Reinf stl for steps	lb	3	0.29	0.20- 0.35
Sewer Items				
Exc, unc	cy	4	7.75	5.50- 11.50
Brick masonry	lf	1	28.00	....
	cy	6	112.50	90.00-135.00
RCSP, 30"	lf	2	14.66	10.00- 19.32
24"	lf	2	12.13	7.50- 15.23
21"	lf	2	9.55	7.00- 12.10
18"	lf	8	11.64	6.00- 22.00
15"	lf	6	12.54	9.45- 19.50
Elongated basins rf2	ea	5	630.00	540.00-900.00
rf1	ea	7	540.57	465.00-800.00
Standard basins	ea	6	360.00	280.00-500.00
RCSP basin conn, 18"	lf	1	15.00	....
15"	lf	3	16.30	9.40- 20.00
Subgrade gravel	t	4	9.75	8.50- 12.00
Bracing lumber	Mbf	5	110.00	100.00-125.00
Basins abandoned	ea	2	65.00	60.00- 70.00

All Bids Were Lump Sum On Baltimore Water Main

At an approximate average cost of $44.24 a ft, including a venturi meter and a 24-in. float-operated butterfly valve, Interstate Construction Corp., Baltimore, Md., got the job of furnishing and installing a 1,675 ft, 36 in. reinforced concrete water supply main to the Montebello Tunnel Filtration Plant No. 1 in Baltimore.

The $74,110 award is 17.7% below the engineer's estimate. Rummel, Klepper & Kahl, Baltimore, Md., is the consultant.

The reinforced concrete pipe is steel cylinder type, prestressed, and must test at 150 psi minimum working pressure. The venturi meter is insert tube type, with electric transmitter and receiver.

The contractor furnishes all materials, including 24 and 30-in. cast iron fittings, but excluding lumber.

Wages on the job range from a high of $2.00 for skilled, through $1.45 for semi-skilled, to $1.25 for common laborers.

All bids were Jump sum and included:

1C Interstate Constr. Corp., Baltimore	$74,110
2 Jamat Building Co., Inc., Baltimore	80,144
3 Ruth Engineering Co., Inc.	129,129
EE Rummel, Klepper & Kahl, Baltimore, Md.	90,000

Fixed price items were:

Bids: 9-17-58 Items	Unit	Unit Prices
Excavation below subgrade	cy	$3.00
Borrow for trench backfill	cy	2.00
Conc for buttresses & encasement, in excess of 25 cu yd	cy	30.00
Stabilizing material	cy	4.00

Commence: 10-1-58 Completion schedule: 180 working days Liquidated damages: $50/cal day

ENGINEERING VIBRATIONS
With Applications to Structures and Machinery

JUST PUBLISHED — Gives proved methods for accurate, easier analysis of vibrations. Explains classical analytical techniques and also shows modern approximation methods, such as the powerful phase-plane graphical method. Many practical applications, including dynamic structural loading, are described. **By L. S. Jacobsen, Stanford U., and R. S. Ayre, Johns Hopkins U. 564 pp., 383 illus., $10.00.**

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When you master this practical book, you have at your command about 80 per cent of the mathematical procedures and methods needed by any engineer or technician in his entire career. You get clear explanations of complex quantities, the tensor theory used in solving modern problems with electronic computers, determinants, conic sections, and scores of other topics. There is a special section on empirical curves and waveforms. **By Philip L. Alger, GE Company. 360 pp., 117 illus., $7.75.**

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Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Iron and Steel Products: Last, Nov. 13; Next Dec. 11
- Wood Products, Glass, Explosives, Chemicals: Last, Nov. 20; Next Dec. 18
- Clay Products, Lime, Plaster, Paint, Roofing: Last:, Nov. 27; Next Dec. 25
- Wage Rates, Building Board, Lath, Insulation: Last, Nov. 27; Next Dec. 25

CEMENT, AGGREGATE, READY-MIXED CONCRETE—F. O. B. CITY

	PORTLAND CEMENT* Per bbl. C/L lots cash, dis. not deducted			SAND AND GRAVEL Per ton, carload lots			CRUSHED STONE Per ton, carload lots		CRUSHED SLAG Per ton, carload lots, f.o.b. plant		CONCRETE BLOCK 8x8x16-in.* truckload del.* per block		CONCRETE Ready Mixed 1:2:4 del. 50 cy & over
	Paper	Bulk	Mortar	Gravel, 1½ in.	Gravel, ¾ in.	Sand	1½ in.	¾ in.	1½ in.	¾ in.	Sand grav.	Lt. wgt. agg.	
Atlanta	$4.35	$3.93	$3.60	$3.10s	$3.10s	$3.50‡s	$2.18s	$2.33s	$1.65r	$1.75r	$0.175o	$0.21o	$14.50y
Baltimore	3.90s	3.80s	3.32ss	2.80‡s	2.80‡s	2.25‡s	2.65‡s	2.90‡s	2.05‡s	2.00‡s	.18s	.18s	13.10/13/60
Birmingham	4.23c	3.80‡f	.....	2.53ss	2.53ss	2.13ss	2.75s	2.75s	1.65r	1.75r	.18	.18	13.55q
Boston	5.80ri	4.85s	4.67rim	3.00ss	3.00ss	3.00ss	1.75ss	1.85ss	.....	.....	.23o	.275so	15.00p
Chicago	4.13ag	3.87ag	3.90/3.95g	3.78‡r	3.78‡r	4.13‡r	3.95‡r	3.95‡r	3.25‡s	3.25‡s	.25‡r	.25‡r	13.80r
Cincinnati	4.68r	4.18r	4.18r	2.20‡ru	2.34‡ru	2.34‡ru	2.64‡ru	2.64‡ru	1.80u	1.80u	.19o	.24so	13.25ay
Cleveland	N.A. in C.L.	.....	3.89‡or	2.25or	2.10or	1.75or	4.80‡a/	4.80‡a/	3.45‡/	3.45‡/	.....	.22/	14.65/
Dallas	3.75s	3.25s	3.63	2.65‡	2.70‡	1.90‡	2.43	2.63	.....	.....	.....	.27	13.50
Denver	4.70s	4.20s	4.79	1.90	2.05	1.20‡s	.....	3.35‡s	.....	.....	.22	.245so	10.70
Detroit	4.25s	3.75s	3.72s	4.50‡abe	4.50‡abe	4.35‡abe	3.75‡se	3.75‡	3.50‡	3.50‡	.24	.27o	14.40
Kansas City	4.23s	3.83s	4.10s	.....	.....	1.70‡s	2.00‡s	2.00‡s	.....	.....	.23s	.26r	13.50
Los Angeles/	5.12‡h	4.68‡h	5.60r	2.50‡sf	2.70‡sf	2.41‡sf	2.41‡sf	2.48‡sf	.....	.....	.17‡m	.255sm	13.95kl
Minneapolis	4.42s	4.01s	4.08s	2.70‡se	2.70‡se	1.60‡se	3.95‡se	3.95‡se	.....	.....	.19q	.....	14.20/
Montreal	3.26‡de	3.11‡de	3.73‡de	1.90‡s	2.15‡s	2.40‡s	1.90‡‡	2.15‡‡	2.00‡	2.00‡	.20	.28‡	10.80ab
New Orleans	4.06s	3.65s	3.85s	2.45b	2.45b	2.00‡‡	.....	.....	1.45	1.65‡	.27‡r	.....	14.00s
New York	4.65s	4.14s	3.60	.....	.....	3.20‡‡	3.10‡‡	3.10‡‡	.....	.....	.23s	.27‡‡	17.40sn
Philadelphia	4.57‡s	4.16‡s	3.61‡	2.85‡s	2.85‡s	2.35‡s	2.70‡	2.80‡	2.00	2.35	.25/.33	.....	14/15d
Pittsburgh	5.05‡kh	4.62‡/	5.00kR	2.85‡qy	2.85‡qy	3.05‡qy	2.00‡qy	2.00‡qy	2.20w	2.20w	.26r	.28r	15.80s
St. Louis/‡	4.10/4.65c	3.76/4.06r	3.86/4.15c	3.25smz	3.10smz	2.40/3/10smz	1.65s/r	1.75s/r	.....	.....	.34‡	.30‡r	13.65/13.15
San Francisco	4.60r	3.80r	4.85r	2.02	2.02	2.12	2.17	2.17	.....	.....	.24	.28‡	13.00r
Seattle	4.22‡s	3.70s	4.40s	4.25‡bm	4.25‡bm	4.25‡bm	4.50‡bm	4.50‡bm	.....	.....	.26s	.27so	13.90/
Toronto	4.00sn	3.84sd	4.00sn	2.40	2.40	2.05	2.20	2.20	2.20	2.20	.26	.275c	15.25s

‡ Delivered. * Prices incl. dealers discount except as noted. / Add 4% sales tax. // Add 2% intrastate sales tax.

CEMENT: [a] Less 10¢ disc. 15 days. [b] Less 2% disc. 15 days. [c] Less 10¢ disc. 10 days. [d] 10¢ disc. 20 days. [e] Truckload lots. [f] Fob mill, add $14.58 to $21.31 per car switching charges. [g] fob mill + freight. [h] LCL. [i] Less 2% disc. 10 days. [j] Truck lots, fob yard. [k] 100 bag lots [l] over 150 sacks. [m] Sold in bags only. [n] Less 5% disc. 30 days.

SAND GRAVEL, STONE & SLAG: [a] Truck lots. [b] Per cu. yd. [c] 5 tons or more. [e] Less 2% disc. 10th [f] Less 2% disc. 15th. [g] Less 5% for cash. [h] Less than 5 tons. [i] Plus 6% mun. & prov. tax. [j] F.o.b. quarry. [k] Barge lots and. [l] F.o.b. scow Hudson river. [m] Less 2% for cash. [n] F.o.b. cars. [q] F.o.b. yard [r] Less 5% disc. 15th. [s] Less 2% disc. 10 days. [t] Less 10¢ disc. 10 days. [u] Less 5¢ disc. 10 days. [v] Less 2% disc. 15 days. [w] Less 10¢ disc. 15 days. [x] Incl. 35¢ del. charge.

CONCRETE BLOCK: [a] Cinder. [b] Waylite. [c] Haydite. [d] Celocrete. [e] 8¼ x 8 x 12 in. [f] 8 x 4 x 16. [g] F.o.b. truck at job. [i] F.o.b. plant San Rafael. [m] F.o.b. yard. [n] 8 x 8 x 16. [q] Less 2% disc. 10 days. [p] Less 2% disc. 10th. [q] Less 5% disc. 10th. [r] Less 2% disc. 15 days. [s] Less 2% disc. cash. [t] Superx, 7 x 9 x 18. [u] Less 5% disc. 10 days.

Ready MIXED CONCRETE: [a] 6 cu yd or over del. Min. [b] 25 cu yds or more. [c] 10-100 cy. brackets. [d] 1-3 mi. zone add 15¢ for ea. add'l 1-mi zone. [e] 2,000 lb comp. [f] 2,500 lb. comp., less 5% disc. 30 days. [g] Less 25¢ disc. 15 days. [h] Less 30¢ for cash. [i] 5% off for cash. [j] 2% off for cash. [k] Federal tax included. Add 6% mun. & prov. tax. [l] 1:2½:3½ base price. [m] F.o.b. yard. [n] Plus escalator clause. [o] Less 2% disc. 15 days. [q] Less 50¢ disc. 15 days. [r] Less 2% disc. 10 days. Add 50¢ per zone. [s] 2500 wgt. [t] Less 5% disc. 10 days.

CASH DISCOUNTS CEMENT to Contractors: Truck delivery, 2% for cash on 10th of month; on carload deliveries, no trucking, same as dealer cash discount 10¢ per bbl. for payment within 15 days of date of invoice. Subject discount 10¢ per bbl. 20 days in Montreal.

CURRENT MAXIMUM PRICES AT CEMENT MILLS

Charge for bags not included. For paper bags add 40¢ per bbl., not refundable

	Bulk		Bulk		Bulk		Bulk		Bulk
Richard City, Tenn	$3.45†	Buffington, Ind	$3.40†	Steelton, Minn	$3.45†	Muskegon, Mich	$3.45†	Toledo, O	$3.45†
Clinchfield, Ga	3.45†	Independence, Kan	3.25†	Leeds, Ala	3.30†	Saginaw, Mich	3.45†	Milwaukee, Wis	3.50†
Kingsport, Tenn	3.45†	Hannibal, Mo	3.35†	Duluth, Minn	3.45†	Wyandotte, Mich	3.45†	Green Bay, Wis	3.50†
West Des Moines, Iowa	3.50†	Northampton, Pa	3.35†	Hudson, N. Y.	3.35†	Buffalo, N. Y	3.35†	Ironton, O	3.45†
Nazareth, Pa	3.35†	Universal, Pa	3.60†	Alpena, Mich	3.35†	Oswego, N. Y	3.60†	Montreal City	2.84†
Bath, Pa	3.35†	Waco, Tex. (+ 10¢ tax)	3.35†	Detroit, Mich	3.45†	Cleveland, O	3.50†	W. Winfield, Pa	3.60†
Lesley, Pa	3.35†	Giant, S. C	3.45†	Howes Cave, N. Y	3.35†	Alsen, N. Y	3.35†	Security, Md	3.35†

† *Prices to hold for first quarter of* 1958.

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS—F. O. B. CITY

	PAVING BRICK AND BLOCK			PAVING ASPHALT Per ton, less than 80 penetration		ASPHALT BINDERS—FLUXES Per gal., 60-300 penetration		CUTBACK ASPHALT MC per ton		ROAD OIL Per gal.	ASPHALT EMULSION RS-1 Per gal.	
	Granite Per M lots of 50,000 4x4x8 in.	Brick per M 3x4x8½ in. carload lots	Wood per sq. yd. 3½ in. 16-lb. treat	Tank car	Drums	Tank car	Drums	Tank car	Drums	Tank car	Tank car	Drums
Atlanta	.....	.....	.....	$30.50‡	$45.00‡	$0.155	$0.205	$0.135 Pm‡	$0.20 Pm‡	$0.14‡	$0.1355	$0.205
Baltimore	180.00‡	.....	.....	23.00i	.....	.096i	0.135i	.106wF	.19wF	.10i	.1084	0.1954
Birmingham	.....	86.00i	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Boston	.....	.....	.....	22.00ap	48.00ap	22.00s	48.00s	.105wFw	.34wFw	.135woE	.148OE	.225woGs
Chicago	180.00‡o	90.00‡ab	3.95/4.00‡aj	21.20b	31.20b	20.40bv	30.40bv	.975bwH	.1775bwH	.080b	.....	.....
Cincinnati	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cleveland	.....	89.50‡dj	6.30y	25.00vA	.....	25.00vA	.....	.1118wAF	.....	.....	.1190LAG	.21AG
Dallas	e	40/78	e	26.82	46.20	.1138	.1983	30.45	52.40	.1100	.1138	.1983
Denver	.....	88.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Detroit	.....	116.60	.....	23.05	.....	23.45v	.....	13.80/	.....	.1133	.....	.28
Kansas City	e	e	e	18.00vl	.....	18.00w	.....	.0825wJ	.....	.06r	0.135r	.....
Los Angeles/	e	.....	e	23.50dmz	.....	22.50dw	.....	34.60dz K	.....	23.00dh	.1038/	.2038/
Minneapolis	.....	.....	3.73h	26.00	.....	26.00r	.....	0.115w	.....	0.108	.136r	.....
Montreal	e	e	e	23.50n	50.50n	.170n	.220n	18.70wnE	33.70wnE	.154n	.243na	.27na
New Orleans	.....	.....	.....	20.00v	.....	20.00w	.....	.095ew	.....e	.085wE	.098wRL	.1903wE
New York	.....	.....	3.80/	20.99m	42.94m	20.99sl	40.94sl	9.61wF	19.01wF	.....	9.68m	19.11m
Philadelphia	175/185	110/120	4.06	24.00/U	.....	24.00/U	.....	.11wFU	.....	.105/U	.....	.....
Pittsburgh	60.00k	88.25kw	6.35x	21.40kz	.....	21.40kw	.....	.1811kw	.....	.142Y	.1411kq	.....
St. Louis/‡	.....	.....	.....	19.74/	.....	.1355/	.....	.0893/wM	.0918/w	0.1455	.825Q	.30‡
San Francisco	.....	70.00	.....	23.50y	42.00y	20.10qbv	38.90qbv	34.50y N	47.50y N	24.25wY	25.50wX	.1925wX
Seattle	.....	.....	.....	25.00s	40.00h	25.50sw	.....	26.50 X	.....	24.25wY	23.50hwX	45.10kwX
Toronto	.....	135.00	4.50/	40.10	59.38	0.2005	0.2445	0.214w	0.258w	0.198	0.2182	.2712

‡ Delivered. / Add 4% sales tax. // Add 2% intrastate sales tax.

PAVING BRICK & BLOCK: [a] Less 2% disc. 10th. [b] 3 x 3½ x 8. [c] 2½ x 8½ x 4. [d] Truckload lots. [e] Not used. [g] 2" interior 6 lb tr. [h] Less $1/Mdisc. 15th. [h] 2" tr, 6 lb. [j] 3 x 3 x 8½. [j] 2½", 6 lb. tr. [k] Used. [l] Redshale. [m] Pine; est $6.57. [n] Truck del. [o] Less $1/M disc. 15 days.

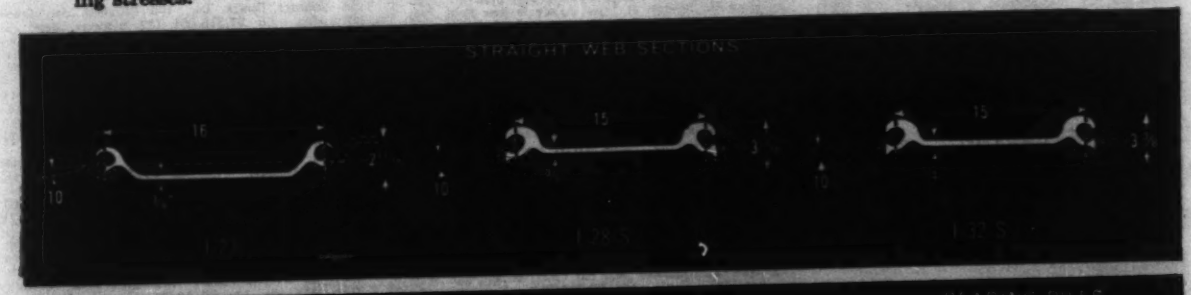
ASPHALTS: [a] F.o.b. refinery, Everett, Mass. [b] F.o.b. refinery, Lockport, Ill. [c] F.o.b. Sugar Creek, Mo. [d] F.o.b. refinery, El Segundo. [e] F.o.b. Baton Rouge. [f] F.o.b. Hartford, Ill. [g] F.o.b. refinery, Richmond, Calif. [h] F.o.b. Martinez. [i] F.o.b. refinery, Baltimore. [j] F.o.b. refinery, Inglewood, Calif. [k] 80-110 'penetr. [l] Less than 100 penetr. [m] 40/300 penetr. [n] F.o.b. refinery, Montreal. Fed. tax included; add 6% for mun. & prov. [o] Drums not avail. Shipped in steel bbl. [p] 80/70 penetr. [r] In customer's drums. [s] Shipped in drums, per drum. [t] 150/300 penetr. [u] Per 100 gal. [v] Per ton. [w] Per gal. [x] Also tank trucks. [y] F.o.b. Oakland. [z] F.o.b. Edmonds. [A] F.o.b. refinery, Cleveland. [B] F.o.b. Destrehan, La. [E] RC. [F] Also RC. [G] Also MS, SS. [H] RC 0-6 incl. [I] MC 4. [J] MC, RC $0.098. [K] MC 3, 4, & 5. [L] MS. [MC 1-5, RC 1-4, $3.0918. [N] MC 3. [O] Truckload. [P] F.o.b. refinery Savannah: $0.09/gal., tank cars; $0.25/gal., drums. [Q] F.o.b. Eldorado, Ark. [R] Delivered within 50 mi. [S] Less 2% disc. 10 days, net 30. [T] Less 1% disc. 10 days. [U] F.o.b. refinery. [V] Less 2% disc. 15 days. [W] SC 2. [X] RS 1. [Y] SC 1. [Z] Incl. 10% Sales Tax.

INLAND STANDARD STEEL SHEET PILING AND BEARING PILES

High tensile strength permits driving and redriving as many as 15 times without distortion

All Inland Steel Sheet Piling is rolled from a special steel—ASTM Specification A-328, tensile strength, 70,000 pounds per square inch, minimum yield point, 38,500 pounds per square inch—your assurance of the strength, toughness and uniformity required to withstand repeated driving and pulling stresses.

For years, Inland Piling has been successfully used for permanent and temporary construction applications ranging from jetties, dock and sea walls to wharves and giant cofferdams. Inland bearing piles have helped provide solutions for some of the most difficult foundation problems.



specifications

SECTION	I-23	I-28-S	I-32-S	I-22	I-27
Wt. per ft. of pile	30.7 lbs.	35.0 lbs.	40.0 lbs.	36.0 lbs.	36.0 lbs.
Wt. per sq. ft. of wall	23.0 lbs.	28.0 lbs.	32.0 lbs.	22.0 lbs.	27.0 lbs.
Moment of Inertia	5.5 in.^{4}	3.5 in.^{4}	3.6 in.^{4}	22.4 in.^{4}	53.0 in.^{4}
Section Modulus	3.2 in.^{3}	2.4 in.^{3}	2.4 in.^{3}	8.8 in.^{3}	14.3 in.^{3}
Section Modulus per linear ft. of wall	2.4 in.^{3}	1.9 in.^{3}	1.9 in.^{3}	5.4 in.^{3}	10.7 in.^{3}

BEARING PILES—PROPERTIES FOR DESIGNING

nominal size	weight per foot	depth of section D	area of section	flange		web thickness Tw	axis 1-1			axis 2-2		
				width F	thickness Tf		I	S	r	I	S	r
in.	lbs.	in.	in.^{2}	in.	in.	in.	in.^{4}	in.^{3}	in.	in.^{4}	in.^{3}	in.
12 x 12	53	11.780	15.58	12.046	.436	.436	394.8	67.0	5.03	127.3	21.2	2.86
	74	12.122	21.76	12.217	.807	.807	568.5	93.5	5.10	184.7	30.2	2.91

Inland rolls both straight web and deep arch piling in a variety of shapes and weights to meet specific piling requirements and for extra corrosion resistance, in Copper Alloy grade. Fabricated and sheet piling accessories including fabricated corners, tees, y's, crosses and taper piles are also available plus H and I Beams for batter or bearing piles and a wide range of other structural shapes.

For complete specifications on special sections produced by Inland contact the nearest Inland Sales Office.

INLAND STEEL

30 West Monroe Street,
Chicago 3, Illinois

Sales Offices: Chicago · Milwaukee · St. Paul Davenport · St. Louis · Kansas City Indianapolis · Detroit · New York · Houston

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, Reports
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BUILDINGS—BA

Mass., Wilmington—SCHOOL—BA 12/8—Town, Supt. Schools, Church St., elementary school, Glen Rd. $400,000. Plans deposit $100. Valtz & Kimberley, Inc., 820 Lynn Fells Parkway, Melrose, archt. CD 12/9/57, under LB.

▲ Mass., Boston—MEDICAL RESEARCH—BA 12/17—Boston University School of Medicine, 755 Commonwealth Ave., Boston, Medical Research Bldg., East Concord St., South End. $2,500,000. Shepley, Bulfinch, Richardson & Abbott, 1 Court St., archts. Goldberg-LeMessurier Assoc., 669 Boylston St., structural engrs. CD 3/24.

BUILDINGS—LB & CA

† Scaldini, Inc., 15 Reardon Rd., Medford, Mass., LB $806,149, est. $800,000, Proj. Mass 59-C-Fed-5-A-9, ELEMENTARY SCHOOL, Hanscom Air Force Base, Cambridge Research Center, BEDFORD, MASS. Housing & Home Finance Agency, 346 Broadway, New York, N. Y. Bids Nov. 18. CD 11/5.

E. Turgeon Constr. Co., 42 Weybosset St., Providence, R. I. LB $822,706, CHURCH and MONASTERY, PORTSMOUTH, R. I. Portsmouth Priory & School, Order St. Benedict, Corey's Lane, Portsmouth, N. H. Bids Nov. 14. CD 11/12.

▲ Green Acres, Inc., 139 Wintonbury Ave., Bloomfield, Conn., Owner Builds. $2,000,000, 200 HOUSES, Cadwell Rd., BLOOMFIELD, CONN.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ N. J., Trenton—BA 12/18—City, City Hall, sewerage addns., alterations, sewage treatment plant. $6,000,000. Bogert & Childs, 145 E. 32 St., New York 16, N. Y., engrs. (Correction—engineers' address). CD 11/7.

HEAVY CONSTRUCTION—LB & CA

▲ Gull Contg. Co. and L. G. DeFelice & Sons, Inc., 33-15 Lawrence, Flushing, N. Y. LB $3,387,270 (8 bidders), 1 mi. section 8-lane Scenic Parkway parallel to Niagara River and gorge between Treadway Inn and Goat Island, Niagar Falls, Niagara Co., Spec. No. 632.0, Niagara Contr. No. N18, NEW YORK. Power Authority of State of New York, The Coliseum Tower, 10 Columbus Circle, New York 19, N. Y. Bids Nov. 20. Bids Oct. 16 rejected. CD 10/3.

▲ NEW JERSEY—Comm. State Hy. Dpt., 1035 Parkway Ave., Trenton,
N. J.—Thomas Nicol Co., Hamilton Rd., Farmingdale, N. J. CA $929,052, wid'n., resurf. 4.72 mi. U. S. Rte. 30, Sect. 1, from Taunton Rd. to Wellington Ave., Camden Co. Bids Nov. 7, awarded Nov. 18;
N. J.—Franklin Contg. Co., U. S. Hy. No. 46, Little Falls, N. J. CA $670,198, dualization 1.706 mi. U. S. Rte. 202, Sect. 2, from Beechwood Dr. to Huyler Rd., Branchburg Twp., Somerset Co.;
N. J.—Manzo Constr. Co. Inc., State Hy. No. 34, Matawan, N. J. CA $746,545, grading, drainage and paving 2.5 mi. Rte. 18, Sect. 3, from Pine St. to point 800 ft. east of Spring Valley Rd., Madison Twp., Middlesex Co. Grand total $2,345,795. CD 11/12, under LB.

BUILDINGS—LB & CA

▲ Massett Building Co., 212 N. Georgia Ave., Atlantic City, N. J. CA $1,500,000, 280-unit MOTEL, restaurant, snack bar, swimming pool and ice skating rink, ATLANTIC CITY, N. J. Brighton Hotel, Illinois Ave. and Boardwalk, Atlantic City, N. J. Bids 11/4. CD 10/29.

▲ Green Haven Homes, 241 Marlton Pike, Haddonfield, N. J. Separate Contracts, $2,795,000, 215 unit RESIDENTIAL DEVELOPMENT, Green Haven, HADDONFIELD (Camden P. O.), N. J. Dante J. D'Anastasio, 1815 Federal St., Camden, N. J., archt.

▲ Belfort, Inc., Room 510, Transportation Bldg., No. 6 Penn Center, Phila., Pa. Separate Contracts. $2,200,000. RESIDENTIAL DEVELOPMENT, (200) Bustleton Ave., etc. PHILA., PA.

Joseph R. Farrell, Inc., West Conshohocken, Pa. CA $938,966, est. $1,891,148. general constr. RESEARCH BLDG. (new wing) PHILA., PA. Women's Medical College of Pa., Henry Ave. and Abbottsford Rd., Phila., Pa. Bids Sept. 11. CD 9/18, under LB.

SOUTH

HEAVY CONSTRUCTION—LB & CA

▲ VIRGINIA—Commonwealth of Va., Dpt. Hys., 1221 E. Broad St., Richmond, Bids opened 11/19,
Va.—Lanford & Slater, Inc., Box 5127, Roanoke, Va., LB $238,214, 2.653 mi. 22 ft. x 3 in. b. conc. pavement, bit. top (alt. pen. mac. bit.) beginning Wise Co. line, ending 2.062 mi. N. Wise Co. line, Rte. 63 (64) State Proj. 0063-083-008-009, Fed. Proj. S-527 (7) Russell Co.;
Va.—Barnhill & Long, Box 725, Tarboro, N. C. and L. A. Reynolds Co., Inc., 1100 W. 1st St., Winston-Salem, N. C., LB $2,185,902, 8.48 mi. grade, drain, paving service and frontage roads beginning Int. Rte. 29 and 211 E. of Gainesville, ending 0.391 mi. W. Int. Rte. 29 and 211 W. of Centreville, Rte. 66, State Proj. 0066-076-101; G-1; 0066-029-101, G-1, Fed Proj. I-66-1 (5) 52, I-66-1 (6) 47, Prince William and Fairfax Counties;
Va.—W. W. Tuck & Son, Virgilina, Va. and Adams Constr. Co., Box 60, Roanoke, Va., LB $376,390, 4.46 mi. 24 ft. x 5½ in. bit. conc. base bit. top beginning Int. Rte. 307, ending Prince Edward-Nottoway Co. line, Rte. 460, State Proj. 0460-073-007, Fed. Proj. F-028-2 (6), Prince Edward Co. CD 10/31.

▲ NORTH CAROLINA—State Hy. Comn., Raleigh, Bids opened 11/19,
N. C.—Ballenger Paving Co., Paris Station, Greenville, S. C., LB $1,543,683, est. exceeds $500,000, CABC 9 in., shoulder concrete 8.4 mi. surf. Interstate R. 40 from N. C. 16 in Conover, easterly to Catawba River bridge, Proj. 8.16253, I-40-2(18)132, Catawba Co.;
N. C.—Potts-Brown Co., Box 473, Charlotte, N. C., LB $137,116, est. $75,000-$100,000, grading, CABC b. conc. binder and surf., retaining wall 0.18 mi. south Front St. By-Pass at Tryon Palace in New Bern, Proj. 6.900077, Craven Co. CD 11/10.

▲ LOUISIANA—State Hy. Dpt., Rm. 307, Hy. Office Bldg., Baton Rouge, Bids opened 11/19,
Blount Brothers Constr. Co., 79 Commerce, Montgomery, Ala., LB $3,424,473, rein.-con. deck girder span bridges or as alternate 50 ft. prestressed concrete girder span bridges West Atchafalaya Floodway Crossing, Rte. No. LA-US 190, 1.425 mi. SP Nos. 12-13-30 and 8-04-15 FAP No. F-169, Landry Parish. CD 11/10.

BUILDINGS—LB & CA

▲ Cafritz Co., 1404 K St. N.W. and Charles H. Tompkins Co., 1737 K St. N.W., Wash., D. C., OA Est. $15,000,000, approx. 600,000 sq. ft. twin OFFICE BLDGS., Army-Navy Dr., South Fern and South Eades Sts., ARLINGTON, VA. Cafritz Co., 1404 K St. N.W., Wash., D. C. LeRoy Werner, 1404 K St. N.W., Wash., D. C., archt.

▲ Wm. A. Berbussee Jr., Inc., 322 Royal Palm Way, Palm Beach, Fla., LB $1,927,900, STATE AGENCY OFFICE BLDG., west side of 12 Ave., south of NW 14 St., MIAMI, FLA. State Bd. Comrs. State Institutions, Tallahassee, Fla. Bids Nov. 12. CD 10/10.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	Middle West
Middle Atlantic	West of Mississippi
South	Far West

PROPOSED WORK

Water Supply	Public Buildings
Sewers, Waste Disposal	Mass Housing
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.

BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

MIDDLE WEST

BUILDINGS—BA

▲ O., Euclid—SCHOOL—BA 12/16—Bd. Educ., 23131 Lake Shore Blvd., Junior High School, Elinore Ave. $1,650,000. Plans deposit $40 general, $35 trades. Fulton, DaLaMotte, Larson, Nassau & Assoc., 6014 Euclid Ave., Cleveland, Zone 3, archts. CD 8/21.

HEAVY CONSTRUCTION—LB & CA

▲ WISCONSIN—State Hy. Comn., State Office Bldg., Madison, Bids opened 11/18,
Wis.—F. F. Mengel Co., Wisconsin Rapids, Wis., LB $683,311 (9 bidders), concrete paving 4.09 mi. Illinois State Line-Milwaukee County Line (C.T.H. 43 Sect.) Rd., Interstate Hy. 94, Contr. 1, Proj. I-94-6 (16) 340, Kenosha Co.; LB $366,074 (13 bidders), base and b. conc. 13.237 mi. West County Line-Stevens Point Road and Clark St. Bridge, City of Stevens Point, U. S. Hy. 10, Contr. 1, Projs. DF 019-3 (24) and A.F.E. 49M-940, Portage Co.;
Wis.—Schuster Constr. Co., 300 Elizabeth St., Green Bay, Wis., LB $1,316,001 (12 bidders), base and concrete paving 7.754 mi. S.T.H. 114-North County Line and South County Line-S.T.H. 10 Rd., U. S. Hy. 41, Contr. 1, Projs. F 03-2 (50) and DF 03-2 (49), Winnebago and Outagamie Counties;
Wis.—Ryan Inc., Janesville, Wis., LB $434,629 (11 bidders), grade and subbase 2.303 mi. U.S.H. 14-Illinois State Line (Shopiere Road-Colley Rd. Sect.) Rd., Interstate Hy. 90, Contr. 1, Proj. I-90-3 (12) 183, Rock Co.;
Wis.—Jos. D. Bonness, Inc., 10815 Watertown Plank Rd., Wauwatosa, Wis., LB $575,967 (9 bidders), concrete paving 3.247 mi. Illinois State Line-Milwaukee County Line (S.T.H. 11-Thompsonville Sect.) Rd., Interstate Hy. 94, Contr. 1, Proj. I-94-6 (17) 328, Racine Co. CD 10/28.

† Price Bros.-McClung, Inc., 1800 Summit St., Toledo, O., LB $728,340, est. $805,200 (7 bidders), dredging 1,830,000 cu. yd. silt from Monroe Harbor, MICHIGAN. U. S. Eng., 1101 Washington Blvd., Detroit, Mich. Bids Nov. 12. CD 10/21.

BUILDINGS—LB & CA

▲ De France Constr Co., 1421 Salida Dr., Mentor, O. CA Est. $3,000,000. 93 brick, stone HOMES, Deana's Half Acres, Meister Rd. off Lake Shore Blvd., MENTOR, O. Hugo Bousa, 36407 Euclid Ave., Willoughby, O.

WEST OF MISSISSIPPI

BUILDINGS—BA

▲ Mont., Great Falls—COLLEGE BUILDINGS—BA 12/19—College of Great Falls, 1618 3 Ave. N., 12 college bldgs., incl. student center, admin. bldg. and library, classroom and office bldgs., physical educ. plant, girls' dormitory and heating and maintenance plant. $3,000,000. Page & Werner, Box 1392, archts. Ben F. Hurlbut, 2084½ N. 29th St., Billings, structural engr. Drapes Eng., 104 4th Ave. N., mech. and elec. engrs.

HEAVY CONSTRUCTION—LB & CA

▲ IOWA—State Hy. Comn., Ames, Bids opened 11/18,
Iowa—Booth & Olson Inc., 529 Ins. Exch. Bldg., Sioux City, Iowa. LB $1,6657,421, c. con. 5.877 mi., I-80-2 (8) 70, Cass Co.; LB $678,210, c. con 12.182 mi., F-472 (2), Fremont and Page Counties; LB $170,325, c. con. pavement 4.90 mi., S-1906 (1), Woodbury Co.; LB $249,758, c. conc. pavement widn. 18.523 mi., F-736 (5), Calhoun and Sac Counties; $134,450, c. con. pavement wid'n. 6.452 mi. FN-321, Crawford Co.;
Iowa—Halleti Constr. Co., Crosby, Minn. LB $73,055, c. conc. pavement widn. 5.288 mi., FN-867, Polk Co.; LB $1,718,331, b. conc. 5.988 mi., I-IG-80-2 (9) 76, Adair Co.;
Iowa—Concrete, Materials & Constr. Co., 4096 First Ave. N.E., Cedar Rapids, Iowa. LB $1,633,058, b. conc. 6.352 mi., I-80-2 (10) 82, Adair Co.; LB $76,778, b. con. pavement 1.037 mi., F-1077 (1), Tama Co.;
Iowa—Lee & Johnson, Inc., 215 Ins. Exch. Bldg., Sioux City, Iowa. LB $523,501, b. conc. 11.451 mi., F-51 (7), Guthrie Co.; LB $187,654, b. conc. 5.003 mi., F-1062 (3), Humboldt and Pocahontas Counties;
Iowa—Alexander Constr. Co., 4641 Hiawatha Ave., Minneapolis, Minn., LB $1,645,761, c. conc. pavement wid'n., and b. con. resurf. 6.927 mi., I-80-2 (11)89, Adair Co.;
Iowa—Kaser Constr. Co., 3111 Ingersoll Ave., Des Moines, Iowa, LB $1,069,062, b. conc. 20.335 mi., F-418(4), Mahaska and Poweshiek Counties;
Iowa—Western Constr. Corp., 400 Benson Bldg., Sioux City, Iowa, LB $1,711,838, grading 1.452 mi., I-IG-03-6(1) I-IG-29-6(1)143, Woodbury Co. CD 11/6.

▲ J. A. Tobin Constr. Co., 3701 Rainbow Blvd., Kansas City, Mo., CA Est. $1,375,000 (1st Phase) (A)-12 mi. Section of Pea Ridge Line from Cadet, Mo. to new iron ore mines of St. Joseph Lead Co. and Bethlehem Steel Co. Incl. grading and bridge, MISSOURI. Missouri Pacific Railroad, W. H. Hobbs, ch. engr., 13

(Continued on page 90)

When this Vassar College power house was designed and built by Lord Electric, the company was already a pioneer in the electrification of public and business buildings. That was

yesterday, in **1908**

today, in **1958**

this company's far flung operations embrace every type of electrical installation. On forward-looking projects such as American Airlines' huge 784,000 sq. ft. jet maintenance hangar at Idlewild, New York, Lord's long experience and advanced methods pay off for owner and general contractor alike.

It's a far cry from the power house above to the bank of oil-filled transformers shown at the right. In this picture our electrician is connecting (three 500 MCM per phase) leads to a 750 KVA 4160 volt primary-277/480 volt secondary transformer.

The next picture shows two of our people on the Spider scaffold mechanism used to install the 100 amp trolley duct which feeds current to operate the great hangar doors electrically.

In the bottom picture Gerard A. Carey, Lord's project foreman, explains the deluge section of the Airport Alarm Board. This board and the system it controls provide instantaneous, automatic safeguards against almost every contingency that can jeopardize such an important and sensitive installation.

Project:
American Airlines
Jet Maintenance Hanger
General Contractor:
Turner Construction Co., Inc.
Architect:
Kahn & Jacobs
Assoc. Architect:
Roy S. Bent
Engineer:
Jaros Baum & Bolles

Lord Electric's long established stature in the industry, its excellent labor relations in all parts of the country, and the tremendous scope of its experience with both government and industry all recommend the company for consideration for your next electrical installation. Your inquiry will receive prompt attention. Please write to Lord Electric Co., Inc., 10 Rockefeller Plaza, N. Y. 20.

LORD ELECTRIC COMPANY, INC.

BOSTON NEW YORK PITTSBURGH PORTLAND, ORE.

Established 1895

They cut a flood control job

with Allis-Chalmers construction machinery!

Don Cunningham Construction Co.—with a crack crew and a fleet of Allis-Chalmers construction machines—have set an outstanding record on a New Mexico soil conservation job. They completed a flood control project scheduled for 180 days in 75! It involved 325,000 yd of earth fill.

Don Cunningham gives major credit to his Allis-Chalmers fleet—motor scrapers, crawler tractors and motor grader. He's convinced that top machine availability and extreme ease of handling are the big reasons why men and equipment were able to maintain the record pace. Cunningham estimates profit on this contract will be 20 percent greater than figured in the original bid—a hefty bonus on any job!

A SURE-FIRE SUCCESS FORMULA!

The Cunningham Construction Company is proud of its reputation for high-production earth moving. Says Don Cunningham: "The combination of Allis-Chalmers' productive machines and a first-rate operating crew, teamed with the excellent service our dealer provides, amounts to *an unbeatable formula for sure profits in this industry.*"

The equipment spread includes four Allis-Chalmers motor scrapers—two TS-360's and two TS-260's—plus five turbocharged HD-21 crawler tractors. Two of the tractors are used as pushers, one as a dozer. Another HD-21 tows a four-gang sheepsfoot roller and the fifth pulls an 18-yd scraper. An Allis-Chalmers FORTY FIVE motor grader levels fill, keeps haul routes smooth for high-speed scraper cycles.

Big 120-horsepower FORTY FIVE motor grader blades fill at dam site, keeps pace with fast-moving equipment like the 20-yard TS-360 motor scraper at right.

The flood control job consists of building two dams and diversion dikes, moving an estimated 325,000 cu yd in the Dona Ana area north of Las Cruces, New Mexico. Working a 54-hour week, the 10-man crew moved nearly 200,000 yd in the first 4½ weeks. This impressive volume brought construction people from all over Texas and New Mexico to see the spread in action.

Don Cunningham, veteran of more than 30 years in earth moving, points out that such performance is a powerful factor in bringing in more construction jobs.

Look ahead... *move ahead*...and stay ahead

6-month to 2½

Don Cunningham
El Paso, Texas

Four Allis-Chalmers motor scrapers, push-loaded by 225-horsepower turbo-charged, torque converter-equipped HD-21's, moved nearly a quarter of a million yards the first month, helped boost profits 20 percent for the whole job.

PREVENTIVE MAINTENANCE PAYS OFF AGAIN!

Chief mechanic, "Snuffy" Oliver, and his assistant have an effective preventive maintenance program, including daily inspection of tracks, fan belts, blowers, turbochargers, cables, clutches.

This regular maintenance keeps Cunningham's Allis-Chalmers fleet in first-class condition. Daily lubrication, servicing and inspection requires about 20 minutes a day for each machine. No other time was lost during the nine-hour working shift.

Compacting scraper-hauled fill, big HD-21 crawler tractor tows four-gang sheepsfoot roller.

The easy-service design of Allis-Chalmers crawler tractors, motor scrapers and motor graders speeds the preventive maintenance routine. For example, truck wheels, idlers and support rollers need lubrication only once every 1,000 operating hours. Time-saving convenience like this keeps every machine ready for action.

Whether your operations call for one unit or a fleet, you can get high production like this. Your Allis-Chalmers dealer will recommend the right equipment for your jobs—from a complete line of up-to-the-minute construction machinery. See him now and ask for a demonstration on your job. Allis-Chalmers, Construction Machinery Division, Milwaukee, Wisconsin.

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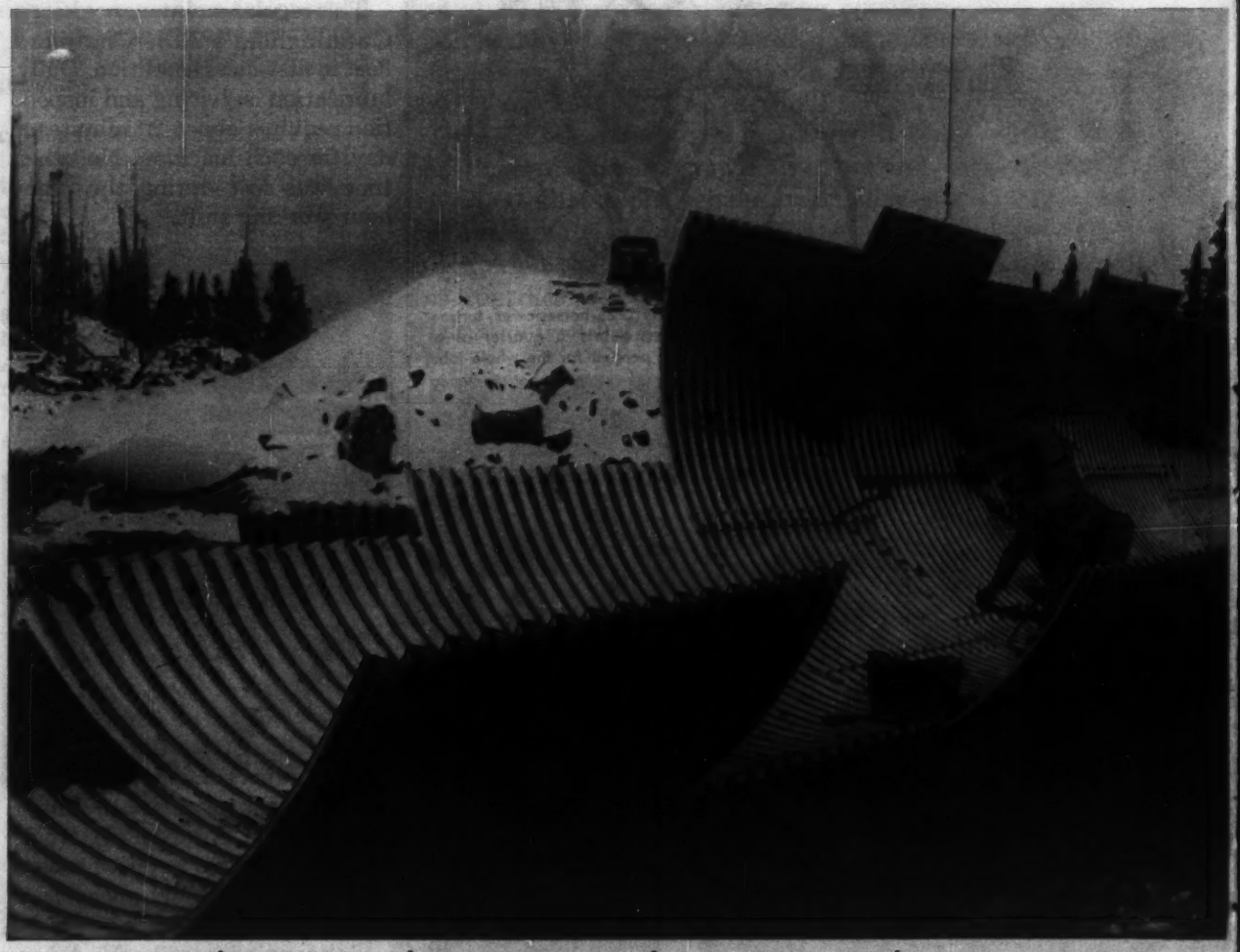
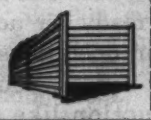
Winter construction goes with Armco Structures



Armco Retaining Walls



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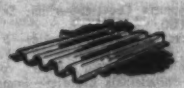
Bridge Plank 

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City _____ Zone ___ State _____

(Continued from page 84)

and Olive Sts., St. Louis 3, Mo. Bids Nov. 10. CD 10/27.

▲ Thomas Bate & Sons, Inc., 2311 10 St., Denver, Colo., CA $1,089,944, two 15 m. g. clear water storage reservoirs, (Hillcrest reservoirs), DENVER, COLO. Bd. Water Comrs., 144 W. Colfax Ave., Denver, Colo., Bid Nov. 12. CD 11/17, under LB.

BUILDINGS—LB & CA

▲ Dickman, Pickens & Bond Constr. Co., Gazette Bldg., Little Rock, Ark., LB $1,000,000-$3,000,000, 132,-000 sq. ft. VILLAGE SHOPPING CENTER, 17½ acre tract, southeast corner Asher and Hayes Sts., LITTLE ROCK, ARK. Rock Creek Development Co., Inc., J. D. Ashley, pres., c/o Edw. F. Brueggement, archt., Pyramid Life Bldg., Little Rock, Ark. Bids Nov. 5. CD 10/31.

▲ Inge-Hayman Constr. Co., Inc., 2115 Butler St., Dallas, Tex. CA Est. $7,250,000. 30 story OFFICE, DALLAS, TEX. Mayflower Investment Co., Fidelity Union Life Bldg., Dallas, Tex. CD 11/25/58.

FAR WEST

HEAVY CONSTRUCTION—BA

▲ Calif., Los Angeles—BA 12/19—Los Angeles Co. Flood Control Dist., 2250 Alcazar St., constr. Storm Drain Proj. 108, Kester Ave. storm drain. $1,000,000. CD 11/7/52.

BUILDINGS—BA

▲ Calif., San Bernardino—OFFICE—BA 12/23—State Div. Architecture, 1100 S. Grand Ave., Los Angeles, 2 floors with partial bsmnt., 66,000 sq. ft. floor space, State Div. Hys. Dist. Office Bldg., W.O. 4075SC. $1,398,000. CD 3/31.

HEAVY CONSTRUCTION—LB & CA

▲ ARIZONA—State 206 S. 17 Ave., Phoenix, Ariz.—Hagen Constr. Co., Globe, Ariz. CA $1,277,059 select mat. agg. base bit. plant mix and seal coat 4.1 mi. Globe-Show Low Highway U. S. 60 Gila Co.;

Ariz.—Wallace & Wallace, Box 470, Phoenix, Ariz. CA $515,146 select mat., agg., base bit. road mix, seal coat, 4.8 mi. new alignment State Rt. 77, Gila Co. Bids Oct. 24, awarded 10/28. CD 11/7 under LB.

▲ CALIFORNIA—State Div. Hys., 120 S. Spring St., Los Angeles, Bids opened 11/20,

E. L. Yeager Co., Box 87, Riverside, Calif. LB $1,532,-117. (7 bidders) conversion from expressway to full freeway 5 mi. San Bernardino Freeway between East of Ontario and Colton, incl. grade separation and interchange at Cherry and Citrus Aves. near Fontana. V111-SBD-26-D. CD 10/22.

▲ Carter Mack Builders, Box 457, Harbor City, Calif. LB $1,075,344 (14 bidders) constr. rein.-con., structural steel transit shed at Berths 143-44, Los Angeles Harbor, LOS ANGELES, CALIF. City Harbor Dpt., 1300 City Hall, Los Angeles, Calif. Bids Nov. 18. CD 12/14/56.

BUILDINGS—LB & CA

▲ J. C. Boespflug Constr. Co., 1912 4 Ave. S., Seattle, Wash. CA $3,378,847, (8 bidders), general contract, 8 rein.-con. BLDGS. totaling 200,000 sq. ft. for Providence Heights College, with water tank and sewerage sys., ISSAQUAH, WASH. Sisters of Charity of House of Providence, 4831 35 Ave. S.W., Seattle, Wash. Bids Nov. 13. Grand total $4,719,801. CD 10/23.

L. G. Massart P & H Co., 4501 9 Ave. N.W., Seattle, Wash. CA $993,186, (6 bidders), mechanical, sewers and utilities, (Issaquah, Wash.);

Industrial Elec. Co., 1828 Yale Ave., Seattle, Wash. CA $347,768, (6 bidders), electrical, (Issaquah, Wash.).

▲ R. J. Daum Constr. Co., and M. J. Brock & Sons, 12537 S. Cerise Ave., Hawthorne, Calif. CA $4,369,-000. constr. Taft HIGH SCHOOL, Woodland Hills, LOS ANGELES, CALIF. Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Bids Oct. 31, awarded Nov. 14. CD 11/6, under LB.

J. A. Campbell, Inc., 6510 Cherry Ave., Long Beach, Calif. LB $808,000, est. $500,000. Increment 3B, STUDENT UNION CENTER, Cerritos Junior College, NORWALK, CALIF. Cerritos Junior College Dist., 11442 E. Alondra Blvd., Norwalk, Calif. Bids Nov. 18. CD 10/16.

CANADA

BUILDINGS—BA

Ont., London—SCHOOL—BA 12/10—East Middlesex High School Bd., John Kennedy, chn., 1 and 2 story, 220x380 ft. structural steel high school, Oxford St. $990,000. Plans deposit $100. Riddle, Connor & Assocs., 422 Wellington St., archts. McGregor & Beynon Ltd., 2310 Yonge St., Toronto, engrs. CD 10/3.

BUILDINGS—LB & CA

▲ Federal Constr. Ltd., 1448 Fort St., Montreal, Que. Owner Builds. $1,000,000. 12 story, 67 x 103 ft. 120 suite brick, rein.-con. apartment block, incl. two bsmnts. and garage, St. Matthew St. near St. Luc St., MONTREAL, QUE. Charles Grenier, 3600 Barclay Ave., Montreal, Que., archt. B. A. Eskenazi, 6819 Decarie Blvd., Montreal, Que., engr.

▲ A. N. Bail Cie, Ltee, 1528 Mackay St., Montreal, Que., LB $1,574,000, HOSPITAL and CHAPELS BLDG. No. 2 and ACCOMMODATION BLDG. No. 3 at Penitentiary site, ST. VINCENT de PAUL, QUE. Dpt. Justice, Penitentiaries Branch, Ottawa, Ont. Bids Sept. 23. CD 9/5.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲† PANAMA—Bureau P. Rds., Dpt. Commerce, Inter-American Highway Office, Wash., D. C., U. S. A.,

Inter-Americana de Estudios Y Empresa, S. A. Panama, CA $1,451,250 Inter-American Highway, from Aguadulce to Santiago, Provinces of Cocle, Herrera and Veraguas, Panama Project 16. Bids Sept. 17. CD 9/30, under LB.

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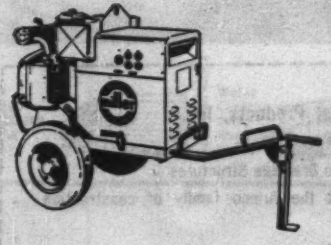

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PROPOSED PROJECTS

SEWERS, WASTE DISPOSAL

▲ Tex., Fort Worth—City, City Hall, defeated bonds Nov. 18, incinerators. $1,550,000. CD 9/5.

▲ B. C., Vancouver—City, City Hall, garbage incinerator False Creek, north foot Ontario St. $4,000,000. Greeley & Hamon, 220 State St., Chicago, Ill., U. S. A., consult. engrs. CD 9/28.

STREETS AND ROADS

▲ PENNSYLVANIA—Pa. Hys. Dpt., 506 North Office Bldg., Harrisburg.

Allegheny, Butler, Lawrence and Mercer Counties—38.14 mi. Int. Hy. northward from Pittsburgh to interchange with proposed Keystone Shortway, $41,000,000, Swindell-Dressler Corp., Box 1888, Pittsburgh, consult. engrs.

Bucks and Montgomery Counties—8 mi. Sellersville by-Pass, $7,100,000.

Montgomery, Bucks and Lehigh Counties—8 mi. relocation L. R. 153. $5,600,000. McCormick, Taylor Assocs., 1981 Suburban Station Bldg., Phila., consult. engrs.

Montgomery and Philadelphia Counties—Imprv. 2 sections L.R. 46116 5.05 mi., $1,100,000, Gannett, Fleming, Corddry & Carpenter, 600 N. 2nd St., Harrisburg, consult. engrs.

Philadelphia Co.—Imprv. 1.51 mi. Stenton Ave., Phila. incl. connection with Bethlehem Pike, $1,190,000, Erdman, Anthony & Hosley Inc., 1835 N. 3 St., Harrisburg, consult. engrs. R. A. Farley, c/o owner, ch. engr.

▲ PENNSYLVANIA—Pa. Hys. Dpt., 506 North Office Bldg., Harrisburg.

Butler Co.—6.82 mi. 4 lane divided by. Butler-by-pass, U. S. Rte. 422 north of Butler City. $8,000,000. Bids early 1959.

▲ Tex., Fort Worth—City, City Hall, voted bonds Nov. 18 streets, storm sewers, traffic signals, street lighting. $22,875,000. CD 9/5.

▲ Tex., Richland Hills—City, voted bonds Nov. 8, complete overhaul of city streets and drainage facilities. $1,540,000. CD 10/16.

▲ Tex., San Antonio—Bexar County, Comrs. Court, Prec. 3, Courthouse, bond election Jan. 17, road constr. and imprvs. $2,170,000. CD 11/11.

EARTHWORK, WATERWAYS

▲ Utah, Bountiful—Bountiful Water Subconservancy Dist., Golden W. Stewart, pres., Bountiful, irrigation sys. $3,500,000. Templeton & Linke, 500 Dooley Bldg., Salt Lake City, consult. engrs. Constr. 1959.

AIRPORTS

▲ Mo., St. Louis—AIRPORT IMPRVS.—City, Bd. P. Service, 304 City Hall, Zone 3, $10,000,000 revenue bond issue to be held Apr. 7, 1959, expansion and imprvs. at Lambert-St. Louis Municipal Airport. CD 6/29/44.

▲ N. C., Charlotte—RUNWAY—City, City Hall, extend NE-SW Runway from 7,500 to 9,000 ft., municipal airport. $1,500,000.

U. S. POSSESSIONS

▲ T. H., Honolulu—PARKING LOT—Waikiki Development Co., International Market Place, 2,500 multi-deck parking lot. $2,250,000. Law & Wilson, 441 North King St., archts. and engrs.

PUBLIC BUILDINGS

▲ Calif., Berkeley—BUS MAINTENANCE, etc.—Alameda-Contra Costa Transit Dist., Suite C, Claremont Hotel, defeated bonds Nov. 4, bus maintenance and storage terminals, Hayward and Concord. $1,500,000. CD 9/29.

▲ Calif., Los Angeles—JAIL—Bd. Supervs., Los Angeles Co., Hall of Records, voted $19,420,000 bonds Nov. 4, mens central jail, Bond Proposition A. (Correction—status.) CD 11/11.

▲ Calif., Los Angeles—WOMENS DETENTION—Bd. Supervs. Los Angeles Co., Hall of Records, voted $6,202,000 bonds Nov. 4, womens detention bldg. Bond Proposition B. (Correction—status) CD 11/11.

▲ Calif., Martinez—HOSPITAL—Contra Costa Co. c/o County Clerk, Courthouse, defeated bonds Nov. 4 hospital addn. $1,500,000. CD 9/18.

▲† Colo., Denver—COURTHOUSE, etc.—General Services Admin., 190 F St. N. W., Wash., D. C., 694,000 sq. ft. courthouse and office, Champa and Stout Sts. and 19 and 20 Sts. $15,000,000. Bids to be opened after first of year. CD 3/9/51.

▲ Conn., Meriden—INSTITUTE—State P. Wks. Dpt., 165 Capitol Ave., Hartford, plans by Walter Crabtree, Jr., 195 Fern St., West Hartford, Horace Wilcox Regional Technical Institute, $2,333,000 John P. Lagnos, 30 Gillett St., Hartford, consult. engr. CD 5/29.

▲ Conn., New London—SCHOOL—Town, Town Hall, plans by Lyons, Mather & Grieshaber, 154 Broad St., Junior High School, Colman St. $1,700,000. Englehardt, Englehardt, Leggett & Cornell, 221 W. 57 St., New York, N. Y., consult. engrs. Payne, Keefe & Neilan, 231 State St., site engr. CD 1/7.

▲† D. C., Wash.—FEDERAL OFFICE—General Services Admin., 18 and F Sts., Zone 25, plans by Perry, Shaw, Hepburn & Dean, 31 St. James Ave., Boston, Mass., and Shepley, Bullfinch, Richards & Abbott, 1 Court, Boston, Mass., federal office building and U. S. Court of Claims, Pennsylvania Ave., Lafayette Park, $35,340,000. CD 10/26/45.

▲ Ill., Barrington—SCHOOL—School Dist. 224, 616 W. Main St., plans by Perkins & Will, 309 W. Jackson Blvd., Chicago, 2 story high school addn., 616 W. Main St. $1,600,000.

▲ Ill., Rockford—NURSING HOME—Winnebago County, Courthouse Bldg. defeated bonds Nov. 4, River Bluff Nursing Home Wing, $2,170,000. Bradley & Bradley, 924 N. Main St., archt. CD 9/10.

▲ N. Y., Batavia—SCHOOL—Bd. Educ., Batavia, referendum Dec. 17, high school, State St. $2,290,000, CD 11/2/44; referendum Dec. 17, Jackson Grade School addn. $400,000.

▲ N. Y., Levittown—SCHOOLS—Bd. Educ., referendum Dec. 6, addns. to 5 elementary schools and constr. 2 schools. $6,086,690. Kelly & Gruzen, 80 5th Ave., New York, archts.-engrs.

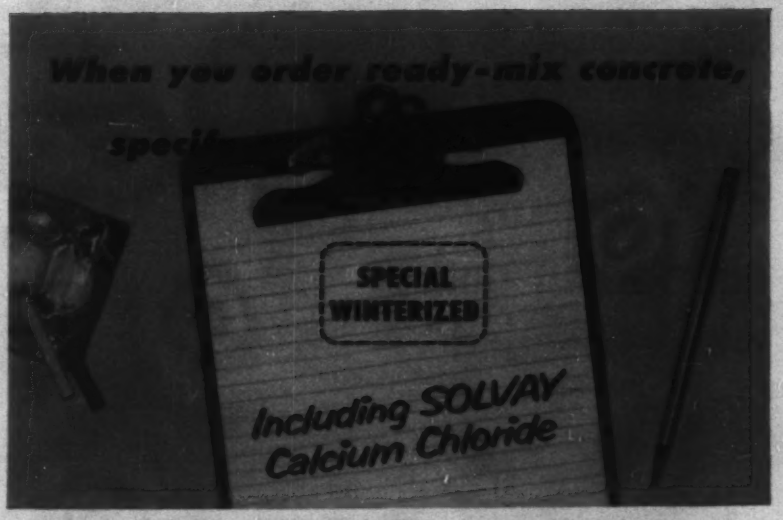
▲ N. Y., Long Beach—SCHOOL—City, City Hall, $2,800,000 bond election Dec. 9, school, Monroe Blvd., Lido Junior High School addn., Lido Elementary School addn. and administration bldg. $3,100,000. Urbahn, Brayton & Burrows, 654 Madison Ave., New York, archts. CD 2/26/37.

▲ N. Y., Lynbrook—SCHOOL—Bd. Educ. Union Federated School Dist. No. 20, referendum vote Dec. 10, two Junior High Schools and Lynbrook High School addn. $3,750,000. CD 4/30.

▲ N. Y., Woodmere—SCHOOL—Bd. Educ. Dist. 14, Woodmere, referendum vote Dec. 10, Junior High School, Peninsula Blvd. west of Mill Rd. $3,000,000. Frederic P. Wiedersum Assoc., 65 Roosevelt Ave., Valley Stream, archts.

▲ O. Cincinnati—FEDERAL OFFICE—General Services Admin., 18 and F Sts., Wash. 25, D. C. plans by Hake & Hake, 2400 Gilbert Ave., Potter, Tyler, Marin & Roth, 123 E. 6 St., and Vogt Ivers, Seaman & Assocs., 34 W. 6th St., archts.-engrs., federal bldg. east side of Main St. $23,000,000. CD 3/28.

▲ Pa., Harrisburg—OFFICE, etc.—General State Auth., 18th and Herr Sts., plans by W. L. Murray, 1600 N. 2nd St., 12 story state office bldg. Capitol Park Exten. Area near 6th and Forster Sts. $7,000,000, CD 4/11/56; underground auto parking facility adjoining proposed state office bldg. in Capitol Park



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▲† S. D., Fort Meade—ADMINISTRATION—Veterans Admin., Munitions Bldg., Wash., D. C., plans by Ellerbe & Co., E. 505 1st National Bank Bldg. St. Paul, Minn., 3 story, 800,000 sq. ft. administration bldg. at Veterans Hospital. $1,700,000. Constr. 1959. CD 8/29/57.

▲ Tenn., Knoxville—DORMITORY—University of Tennessee, Knoxville, plans by Barber & McMurray, 2505 Kingston Pike, women's dormitory, $2,000,000. John L. Meeley Jr., c/o owner, University Campus, owners staff engr. CD 11/14.

▲ Tex., Beaumont—DISTRICT HEADQUARTERS—State Hy. Dpt., Austin, district headquarters (offices, storage, warehousing) $2,000,000.

▲ Tex., Fort Worth—CITY HALL—City Hall, defeated bonds Nov. 18, 6 story city hall addn. $1,550,000. CD 9/5.

▲ Tex., Fort Worth—CIVIC AUDITORIUM—City, City Hall, defeated bonds Nov. 18, civic auditorium. $8,500,000. CD 9/5.

▲ Tex., Fort Worth—POLICE STATION—JAIL—City, City Hall, voted bonds Nov. 18, police station and jail, $2,750,000. CD 9/3.

▲ Wash., Seattle—SCHOOLS—School Dist. No. 1, 815 4 Ave. N., voted bonds Nov. 4, Junior High School, northeast sect., $2,000,000; Junior High School northwest sect., $2,000,000; Junior High School, central sect., $2,000,000; Roosevelt High School addn., $700,000; Garfield High School addn., $600,000; Queen Anne High School addn., $600,000; East Brighton Elementary School, $600,000; Rainier View Elementary School, $600,000; elementary school, northeast sect., $600,000; elementary school, northwest sect., $600,000, CD 1/15/57.

▲ Wash., Seattle—LIBRARY—University of Washington, 15 Ave. N.E. and E. 40 St., Zone 5, library addn. $1,500,000 funds voted. CD 2/14/49.

▲ Wis., Fond du Lac—SCHOOL—Bd. Educ. plans by Schutte-Phillips-Mochon, Inc., 11121 W. Oklahoma Ave., Milwaukee, Senior High School, $4,000,000.

▲ Wis., Wauwatosa—SCHOOLS—Bd. Educ., voted $3,-100,000 bonds Nov. 4, schools.

▲ Ont., Hamilton—CHILDREN'S CENTRE—Lynwood Hall Children's Centre, c/o 170 George St., plans by Wall, Yamamoto & Mathews, 282 Brant St., Burlington, children's centre, Sanitorium Rd., $2,000,000.

▲ Que., Montreal—HIGH SCHOOL—Montreal Catholic School Comn., 3737 Sherbrooke St. E., plans by Gerard Notabert, 3460 Jeanne d'Arc Ave., 3 story, bsmnt., rein.-con., brick high school, Pie IX Blvd. $1,500,000.

COMMERCIAL BUILDINGS

▲ Ala., Birmingham—MOTEL—Fields Hotel Corp., 371 7 Ave., New York, N. Y., plans by Bertrand Goldberg & Assoc., 721 N. Michigan, Chicago, Ill., 6 story, 200 unit motel, 13 St., 2 and 3 Aves. N. $2,500,000.

▲ Ala., Birmingham—OFFICE, etc.—Newman H. Waters, c/o Warren Knight & Davis, archts., Protective Life Bldg., office and auto parking bldg. $6,000,000.

▲ Colo., Denver—CLUB—Pinehurst Country Club, Mile High Center, plans by James S. Sudler & Assocs., 1730 Glenarm, 50,000 sq. ft. Pinehurst Country Club, golf course, tennis courts, stables and riding paths, 3 swimming pools, $1,500,000. CD 8/28.

▲ Conn., Hartford—OFFICE, etc.—F. H. McGraw & Co. of Connecticut, Inc., 51 East 42 St., New York, N. Y., office building, hotel, stores, pedestrian mall, parking, bus platforms and expressways, $50,000,000, to go ahead 1959. F. H. McGraw & Co., 51 E. 42 St., New York, N. Y., consult. engrs.

▲ Conn., New Britain—APARTMENTS, etc.—F. H. McGraw & Co. of Connecticut, Inc., 51 E. 42 St., New York, N. Y., apartments, commercial buildings, shopping center, playground and parking area, four year program. $20,000,000. F. H. McGraw & Co., 51 E. 42 St., New York, N. Y., consult. engrs. CD 3/8/57.

▲ Ill., Chicago—CHEMISTRY RESEARCH—Illinois Institute of Technology, 3300 S. Federal St., plans by Schmidt, Garden & Ericson, 104 S. Michigan Ave., chemistry research bldg., 35 and Dearborn Sts., $3,-000,000. CD 12/1/57.

▲ Ill., Crystal Lake—SHOPPING CENTER—Home Estates Builders Corp., 451 Keith Ave., plans by Walter Kroeber, 310 S. State Rd., Arlington Heights, 32 unit shipping center, incl. paving U. S. Hy. 14. $1,500,000.

▲ Mo., Sunset Hills (St. Louis 23 P.O.)—BUSINESS CENTER—Owner, c/o G. J. Nooney & Co., Railway Exchange Bldg., 611 Olive St., St. Louis, Zone 1, plans by Syl G. Schmidt & Assocs., archts.-engrs., Railway Exchange Bldg., 611 Olive St., St. Louis, Zone 1, business center project: supermarket, department store, drug and variety stores and other shops, incl. parking facilities on 25-acre tract bounded by US No. 66, Lindbergh Blvd. and Roth Rd. Over $5,000,000.

▲ Mo., Sunset Hills (St. Louis 23 P.O.)—RESIDENTIAL DEVELOPMENT—Owner, c/o G. J. Nooney & Co., Railway Exchange Bldg., 611 Olive St., St. Louis, Zone 1, plans by Syl G. Schmidt & Assocs., archts.-engrs., Railway Exchange Bldg., 611 Olive St., St. Louis, Zone 1, residential development to incl. 400-units in 2 story bldgs., U.S. 66, Roth and Geyer Rds. $5,000,000-$6,000,000.

▲ N. J., Ridgefield Park—APARTMENTS—M & J Holding Corp., 10 Knickerbocker Rd., Dumont, 5 multi-story apartments on north side of Rte. 46. $2,500,000.

▲ N. Y., Dobbs Ferry—CATHOLIC CENTER—Archdiocesan Bldg. Comn., 451 Madison Ave., New York, Zone 22, plans by Kiff, Ossan, Voss & Souder, Office of York & Sawyer, 101 Park Ave., New York, Zone 17, Mount-Mercy-on-the-Hudson Center, incl. motherhouse, infirmary for aged sisters, college, high school and elementary school, on 85 acre site. $4,000,000.

▲ N. Y., New York — SCHOOL — Archdiocesan Bldg. Comn., 451 Madison Ave., Zone 22, plans by Eggers & Higgins, 100 E. 42 St., Zone 17, Cardinal Spellman High School, on 31 acre tract at Baychester Ave. and E. 229 St., Bronx Boro. $4,000,000. CD 11/17.

▲ N. Y., New York—ENGINEERING CENTER—Columbia University, 116 St. and Broadway, plans by Voorhees, Walker, Smith & Smith, 101 Park Ave., Zone 17, engineering center, 500 W. 120th St. $5,700,000. CD 11/23/51.

▲ N. Y., New York—APARTMENT—Louis Denbern & Alexander Hirsch, 521 Fifth Ave., Zone 17, plans by H. I. Feldman, 415 Lexington Ave., Zone 17, 19 story, 148 unit apartment, 1-3 E. 14th St. $1,900,000.

▲ N. Y., New York—OFFICE—Manuel E. Kulukundis, 80 Broad St., Zone 4, plans by Kokkins & Lyras, 111 E. 38th St., Zone 16, 32 story office, southeast corner of Madison Ave. and 56th St. at 555-63 Madison Ave. and 50-56 E. 56th St. $4,300,000.

▲ N. Y., New York—LINCOLN SQUARE PROJECT, etc. —Lincoln Center for Performing Arts, c/o Harrison & Abramovitz, chief archts. for entire project, 360 5 Ave., New York, N. Y., Lincoln Square Project, 62 to 66 Sts., Amsterdam and Columbus Aves., Total est. $75,000,000, CD 5/28; plans by Wallace Harrison, c/o Harrison & Abramovitz, 360 5th Ave., New York, N. Y., metropolitan opera house; plans by Max Abramovitz, c/o Harrison & Abramovitz, 360 5th Ave., New York, N. Y., concert hall; plans by Pietro Belluschi, School of Architecture & Planning, Massachusetts Institute of Technology, 77 Mass. Ave., Boston, Mass., Juilliard school; plans by Philip Johnson Assocs., 375 Park Ave., New York, N. Y., School of the Dance; plans by Gordon Bunshaft, c/o Skidmore, Owings & Merrill, 425 Park Ave., New York, N. Y., library and museum; plans by Eero Saarinen, W. Long Lake Rd., Bloomfield Hills, Mich., theatre for repertory drama.

▲ N. Y., New York—OFFICE—Sam Minskoff & Sons, 521 5th Ave., Zone 17, 24 story office, northeast corner 3rd Ave. and E. 43rd St. $6,000,000. Owner changed. CD 6/19/58, under Syndicate.

▲ N. Y., North Tonawanda—COMMERCIAL, etc.—Triangle Industrial Plaza, 344 Stanley, 3 bldgs., 325,-000 sq. ft.; 1 story, 150x900 ft., air-conditioned commercial bldg. for offices, 50,000 sq. ft., brick and block warehouse and 175 x 800 ft. light manufacturing center. $3,000,000. Constr. for next Spring.

▲ N. C., Charlotte—MERCHANDISE MARKET—Dwight L. Phillips, 308 W. Palmer Ave., merchandise market, $2,500,000.

▲ O., Cleveland—SHOPPING CENTER—Suburban Development Co., 3639 Lee Rd., Zone 20, plans by Weinberg & Teare, Citizens Bldg., Zone 14, 300,000 sq. ft. 42 unit shopping center, northwest corner of Brainard and Kinsman Rds. $9,000,000.

▲ O., Cleveland—SCIENCE CENTER—Western Reserve University, 10940 Euclid Ave., Zone 6, plans by Small, Smith, Reeb & Draz, 1010 Euclid Ave., Zone 15, Science Center, Adelbert Rd., $5,270,000.

▲ O., Mansfield—HOSPITAL—Mansfield General Hospital, 335 Gleaner Ave., hospital, $2,225,000.

▲ Ont., Toronto—HOUSING—Barbara Apartments Ltd., c/o Central Mortgage & Housing Corp., 650 Lawrence Ave. W., 279 low rental housing, Howard St. $2,915,000.

▲ Sask., Regina—SHOPPING CENTER, etc.—McCallum-Hill & Co. Ltd., Regina, shopping center and apartment blocks, Hillsdale Area. $4,000,000. Mayer, Whittlesey & Glass, 31 Union Sq., New York, N. Y., consult. engrs.

INDUSTRIAL BUILDINGS

▲ Ala., Bessemer—PLANT—W. S. Dickey Clay Mfg. Co., 2131 29 Ave. N., Birmingham, plant for manufacture vitr. clay pipe and allied products (eventually to be expanded to $5,000,000) between US 11 and Ala. 150. $3,500,000.

▲ N. J., Millington—RESEARCH LABORATORY—International Nickel, Inc., 67 Wall St., New York 5, N. Y., research laboratory, Cornish Farm, Passaic Twp. $3,500,000.

▲ Pa., Pittsburgh—COKE OVENS—Jones & Laughlin Steel Corp., 3 Gateway Center, 59 coke ovens at Pittsburgh Works, 7th Ave. $3,000,000.

UNCLASSIFIED

▲ Alabama—STATE DOCK—Alabama State Docks, Mobile, state dock expansion in Industrial Park, Saraland. $33,000,000 (not financed). Moulton Eng. Co., Ft. Hurlel St., Mobile, consult. engrs.

▲ Arkansas—GAS PIPE LINE—Arkansas Louisiana Gas Co., 300 W. Capitol and (subsidiary) Arkansas Industrial Pipeline Co., Little Rock, 130 mi. 18 in. and 100 mi. 16 in. gas pipe line from Clarksville, Franklin Co. to Helena. $15,000,000.

▲ Ont., Toronto—HOME FURNISHING—City, City Hall, home furnishing bldg. for Canadian National Exhibition, Exhibition Park. $2,000,000. CD 12/29/43.

▲ Que., Montreal—ARENA—City, City Hall, plans by Jean Julien Perrault, 3737 Van Horne Ave., 306 ft. diam. rein.-con. frame, aluminum roofing, concrete arena, pile fdns., incl. heating, ventilating and refrigeration, Maisonneuve Park, Viau and Boyce Sts. $2,000,000. CD 5/2.

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
December 10 Maine December 15 Connecticut
STREETS AND ROADS
December 9 Massachusetts December 10 Maine
December 15 Connecticut

HEAVY CONSTRUCTION—LB & CA

▲ **NEW HAMPSHIRE**—Dpt. P. Wks. & Hys., Concord, Bids opened 11/20.
Frank Palazzi & Sons, Inc., 2321 Hartford Ave., Johnston, R. I., LB $1,380,007 (6 bidders) 1.004 mi. b. conc., 3 steel beam bridges, 153, 160 and 177 ft. in length, Bedford, Hillsboro Co. CD 11/11.

▲ **CONNECTICUT**—State Hy. Dpt., Rm. 527, State Office Bldg., Hartford, Bids opened 11/24,
Della Bitta-Bassola, Inc., Clark St., Milldale, Conn., LB $1,383,731 (18 bidders), four 3-span rolled beam bridges and two 7-span rolled beam and welded girder bridges on Relocation Rt. 8, Fed. Aid Proj. F-68 (4), Contract 1, Proj. No. 140-105, Thomaston, Litchfield and Harwinton. CD 11/6.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲† **Pennsylvania and New Jersey**—BA 12/18—U. S. Eng., 2635 Abbottsford Rd., Phila., Pa., dredging approx. 3,800,000 cu. yd. Delaware River, Bucks Co., Pa. and Burlington Co., N. J., ENG-36-109-59-30. $3,500,000. CD 9/19.

BUILDINGS—BA

▲ **Pa., Lock Haven**—HOSPITAL—BA 12/10—Lock Haven Hospital Assn., hospital. $2,502,801. Plans deposit $50, $10 addnl. Specs. B. Kenneth Johnstone, 429 4th Ave., Pittsburgh, archt. Robert Allen Zern, Peoples Bldg., Pittsburgh, engr. CD 5/29.

BUILDINGS—SLC

▲ **Pa., Camp Hill**—SHOPPING CENTER—Neff & Evantash, archts.-engrs., 1920 Locust St., Phila., soon lets contract shopping center for Morris A. Kravitz, Inc., 225 S. 15th St., Phila. $5,000,000. Henley O. Eden, 23 S. Front St., Harrisburg, assoc. archt. CD 6/4.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany,

N. Y.—**Hendrickson Bros., Inc.**, 63 N. Central Ave., Valley Stream, N. Y., CA $4,174,218, 2.33 mi. six-lane divided section Long Island Expressway and 5.3 mi. access and service roads, Nassau Co.; CA $3,013,470, 1.94 mi. section Southern State Parkway and 1.82 mi. access and service roads from Broadway (Amityville) Rd. to point just west of Wellwood Ave., Suffolk Co.; CA $4,384,624, 2.2 mi. six-lane divided section Long Island Expressway and 5.08 mi. access and service roads between Post Road and Jericho Turnpike, Nassau Co.;

N. Y.—**Triple Cities Constr. Co.**, 8 Broome, Binghamton, N. Y., CA $1,651,043, grading, structural work 2.57 mi. four-lane divided section Empire Stateway and 1.4 mi. access roads east of Rte. 11 between Blakesley Rd. and Trim St. in vicinity of Corbettsville southeast of Binghamton just north of New York-Pennsylvania State Line, Broome Co.;

N. Y.—**E. G. De Lia & Sons Constr. Corp.**, 38 Campion Rd., New Hartford, N. Y., CA $1,274,517, reconstr., relocation 5.23 mi. section Rte. 30, Fulton and Hamilton Counties;

N. Y.—**R. A. Petta Constr. Co.**, Delanson, N. Y., CA $720,638 reconstr. 5.21 mi. Section Rte. 67 starting at Ballston Ave in Ballston Spa and extending westward to ¼ mi. east of Harmony Corners, Saratoga Co.;

N. Y.—**E. R. Wolcott, Inc.**, Big Flats, N. Y., CA $588,261 reconstr. 5.31 mi. section County Rd. 138 starting at Wayne-Monroe County line just east of East Penfield and extending eastward to Walworth, Wayne Co. Grand total $15,806,771. Bids Oct. 9. CD 10/13, under LB.

▲ **Hendrickson Bros., Inc.**, 63 No. Central Ave., Valley Stream, N. Y., CA $3,654,210, extension to Bay Park Sewage Plant, Bay Park, MINEOLA, N. Y. County Executive, Nassau County, Old County Court House, Mineola, N. Y. Bids Oct. 28. CD 10/31, under LB.

▲ **Peirler & McLane Corp.**, 33 W. 42 St., New York 36, N. Y., CA $6,463,949, Contr. No. 15, force main tunnel, Newtown Creek pollution control project, Brooklyn and Manhattan Boros, BROOKLYN, N. Y. Dpt. P. Wks., Rm. 2200, Municipal Bldg., New York 7, N. Y. Bids Oct. 22. CD 10/24, under LB.

▲ **PENNSYLVANIA**—Pa. Hys. Dpt., 506 North Office Bldg., Harrisburg,

Pa.—**Pittsburgh Bridge & Iron Works**, 1601 Union Bank Bldg., Pittsburgh 22, Pa. CA $2,053,521, 1,695 ft. constr. superstructure, incl. steel bents, ramps for Crosstown Blvd., viaduct alternations, L.R. 1026 (1A) Pittsburgh, Allegheny Co.;

Pa.—**Sanctis Constr. Inc.**, 410 Marlow St., Pittsburgh 20, Pa. CA $1,296,169, 1,908 ft. constr. abutments, bent foundations, retaining walls, slope-walls, ramp paving, reconstr. Try St. railroad yards, sec. Crosstown Blvd. L.R. 1026 (1) Pittsburgh, Allegheny Co. Bids Oct. 30, awarded Nov. 20. CD 11/4, under LB.

HEAVY CONSTRUCTION—LB & CA

▲ **Frouge Constr. Co., Inc.**, 141 North Ave., Bridgeport, Conn. CA $13,647,000, general constr. Edgemere Houses, Proj. No. NYS-79, Almeda Ave., Beach 51st St., Beach Channel Dr. and Beach 58th St., Queens Boro, EDGEMERE, N. Y. New York City Housing Auth., 299 Broadway, New York, Zone 7, N. Y. Bids Sept. 30. Grand total $17,232,737. CD 10/7, under LB.,
Novak & Co., 1503 East New York Ave., Brooklyn 12, N. Y. CA $1,367,737, plumbing work for Edgemere Houses (Edgemere, N. Y.);
Heating Maintenance Corp., 220 E. 138th St., New York 51, N. Y. CA $1,169,000, heating for Edgemere Houses (Edgemere, N. Y.);
Meyerhawk Elec. Co., 126 W. 32 St., New York 1, N. Y. CA $1,049,000, electrical work for Edgemere Houses (Edgemere, N. Y.).

▲ **Pearce & Pearce**, Niagara Falls Blvd., Buffalo, N. Y. Owner Builds, $8,000,000, 400 HOMES, Green Acres, NORTH TONAWANDA, N. Y. CD 6/26/56.

▲ **Wm. L. Blanchard**, 45 Poinier St., Newark, N. J., CA Est. $3,000,000-$3,500,000, 200,000 sq. ft. unit at Monmouth SHOPPING CENTER, Rts. 35, EATONTOWN, N. J. L. Bamberger & Co., 131 Market St., Newark, N. J. Kahn & Jacobs, 2 Park Ave., New York, N. Y. archts. Abbott & Merkt, 10 E. 40 St., New York, N. Y., engrs.

▲ **Jos. L. Muscarelle, Inc.**, P.O. Box 915, Maywood, N. J., CA Est. $10,000,000, Monmouth SHOPPING CENTER, Rte. 35, EATONTOWN, N. J. Massachusetts Mutual Life Insurance Co., 1295 State St., Springfield, Mass. Kahn & Jacobs, 2 Park Ave., New York, N. Y., archts. Abbott & Merkt, 10 E. 40 St., New York, N. Y., engrs. CD 10/3.

▲ **Boyd H. Kline**, Berwick Rd., Bloomsburg, Pa. CA $2,804,573. general constr. State SCHOOL for Retarded Children, EBENSBURG, PA. General State Auth., 18th and Herr Sts., Harrisburg, Pa. Grand total $4,752,314. Bids Oct. 29. CD 10/31, under LB.
C. P. Wright & Co., 4300 Carnegie Ave., Cleveland, O. CA $1,182,312. heating (Ebensburg, Pa.);
Ace Electric Service Co., 129 N. 3rd St., Phila., Pa. CA $765,429, electrical work (Ebensburg, Pa.).

▲ **Bechtel Corp.**, 220 Bush St., San Francisco, Calif., CA design and construct NUCLEAR POWER PLANT at unselected site near PHILA., PA. High Temperature Reactor Development Assocs., c/o Phila. Electric Co. (with 40 other utility companies) 1000 Chestnut St., Phila., Pa. Grand total $24,500,000. AEC must approve proj. and provide $14,500,000 addnl. for research;
General Atomic Div. of General Dynamics Corp., P.O. Box 690, San Diego 12, Calif., CA nuclear reactor (Phila., Pa.);
Westinghouse Electric Co., 3 Gateway Center, Pittsburgh, Pa., CA generating equipment (Phila., Pa.).

▲† **George Hyman Constr. Co.**, 1010 Vermont Ave. N. W., Wash., D. C., LB $3,139,876 ACADEMIC BLDG. at Fort Lesley McNair, WASH., D. C. U. S. Eng., 1st and Douglas St. N. W., Wash. 25, D. C. Bids Nov. 18. (Correction—low bidder). CD 11/21, under LB.

▲ **Ernest DiSabatino & Sons, Inc.**, 2601 W 4 St., Wilmington, Del., CA $2,500,000 237 suite, APARTMENT, 1303 Delaware Ave., WILMINGTON, DEL. Plaza Corp., 2601 W. 4 St., Wilmington, Del.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
December 19 Kentucky

BUILDINGS—SLC

▲ **Fla., Miami**—HOTEL—Airway Hotel, Inc., c/o Steward-Skinner Assocs., archts., DuPont Plaza Center, soon lets contract 274 room Hotel, Miami International Airport. Jorgensen & Schreffler, 1200 SW 1 St., struc. engrs. Mitchell-Gordon Assocs., 302 Bird Rd., Coral Gables, mech. engrs. A. Herbert Mathes, 628 Lincoln Lane, Miami Beach, consult. archt. CD 11/21.

HEAVY CONSTRUCTION—LB & CA

▲† **Tecon Corp.**, 202 Davis Bldg., Dallas, Tex. LB $16,379,035, Locks for Barkley Lock and Dam, 3 mi. above mouth of Cumberland River, Lyons and Livingston Counties, CIVENG-40-058-59-3, KENTUCKY and TENNESSEE, U. S. Eng., 306 Federal Office Bldg., Nashville, Tenn. Bids Nov. 20. CD 10/17.

▲ **KENTUCKY**—Commonwealth of Ky., Dpt. Hys., Frankfort, Bids opened 11,21,

Ky.—**Wood & Bush Co.**, 410 Ann St., Frankfort, Ky. LB $1,851,649 (10 bidders), grade, drain 4.632 mi. Interstate 75-Covington-Lexington Rd., incl. 3 bridges I 75-7 (5) 160 SP 41-434, Grant Co. CD 10/27;

Ky.—**Sam Nally Co.**, Bardstown, Ky. LB $242,112 (4 bidders), traffic bound surf. 5.378 mi. Alumbaugh-Arwel Rd. from Arvel extending northerly to Estill County line, S-707 (1) SP 55-469;

Ky.—**C. D. Juett**, 417 S. Maple St., Winchester, Ky. LB $251,749 (4 bidders), traffic bound surf. 6.018 mi. Chad-Gordon Pine Mountain Rd. S 239 (4) Letcher Co. CD 11/6.

BUILDINGS—LB & CA

▲ **George A. Fuller Co.**, Munsey Bldg., Wash., D. C. LB $4,282,555 (9 bidders), 300-bed HOSPITAL, Gallow Rd. at Arlington Blvd., ANNANDALE, VA. Fairfax Co. Health Council, Fairfax County Courthouse, Fairfax, Va. Bids Nov. 14. CD 10/24.

▲ **Turner Constr. Co.**, 150 E. 42nd St., New York 17, N. Y., CA Est. $3,000,000, 8 story, 290,000 sq. ft. OFFICE, Lookout, Walnut, 5th and 6th Sts., CHATTANOOGA, TENN. Provident Life & Accident Insurance Co., 721 Broad St., Chattanooga, Tenn. Selmon T. Franklin, 421 Poplar St., Chattanooga, Tenn., archt. Eggers & Higgins, 180 E. 42nd St., New York, N. Y., assoc. archts. CD 7/23.

MIDDLE WEST

BUILDINGS—BA

▲ **Ind., East Chicago**— HOSPITAL — BA 12/16 — St. Catherine Hospital, 4321 First St., 5 story, 92,000 sq. ft., brick hospital addn. $3,000,000. Schmidt, Garden & Erickson, 104 South Michigan Ave., Chicago, Ill., archts. CD 12/3/56.

▲ **Ind., Indianapolis**—STATE EMPLOYMENT SECURITY—BA 12/19—State Office Bldg. Comm., Old Trails Bldg., 3 story, State Employment Security Bldg., 10 N. Senate Ave. $4,000,000. Plans deposit $75. Associated Indiana Architects, 136 E. Market St., archts. CD 11/22/57.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—Dpt. Hys., Columbus, Zone 15,

O.—**Foley Constr. Co.**, 5050 Orchard St., Cincinnati, O. CA $3,430,790, est. $3,603,400, c. conc. paving, wid'n., b. conc. resurf. and structures 4.928 mi. USR 50 Sect. 3.72, F-1100 (4) Villages of Cleves, North Bend and Addyston and in Miami Twp. Proj. 611, Hamilton Co. CA $5,485,847, est. $5,713,000, c. conc. paving and structures 3,734 mi. URS 508, Section 23.11 ACI-1110 (4) Sycamore Twp., Village of Sharonville, Proj. 612, Hamilton Co.;

O.—**C. F. Replogle Co.**, 122½ N. Court St., Circleville, O., CA $2,093,953, est. $2,255,700, c. conc. paving and structures 5.063 mi. USR 33, Sections 19.04 0.00 F-397 (21) Berne Twp., Good Hope Twp. Proj. 591, Fairfield and Hocking Counties;

O.—**Horvitz Co.**, 4375 E. 146 St., Cleveland, O. CA $2,925,067, est. $3,089,400, c. conc. paving and structures 7.35 mi. SR 2 Section 7.39 F-329 (16) Mentor Twp. Village of Mentor, Proj. 595. Lake Co.;

O.—**Bates & Rogers Constr. Co.**, 600 W. Jackson Blvd., Chicago, Ill., CA $567,882, est. $606,800, c. conc paving and structures 0.779 mi. CR No. 74, S-1176 (2) DS-1176 (3) Mad River Twp. and Village of Riverside, Proj. 598, Montgomery Co.;

O.—**Leo H. Hopple**, 181 Wentz St., Tiffin, O. CA $96,010, est. $124,800, paving with bit. road mix surf. course on waterbound macadam base, CR No. 30, DS-1215 (3) Catawba Island Twp., Proj. 599, Ottawa Co.;

O.—**Harry Miller Excavating Co. & C. P. Calaway**, Box 54, Suffield, O. CA $2,758,951, est. $3,327,400, b. conc. on c. conc. paving and structures 1.474 mi. SR 8 Section 11.65 ACI 1093 (4) ACI-1086 (8) City of Akron, Proj. 603, Summit Co.;

O.—**Smith Constr. Co. of Ohio**, P. O. Box 515, Vienna, O., CA $639,709, est. $647,700, b. conc. paving, and structures 4.962 mi. SR 88, Sections (2.04-5.12) F-443 (8) Farmington and Bristol Twps., Proj. 605. Trumbull Co.;

O.—**Shelly & Sands, Inc.**, Thornville, O., CA $433,607, est. $495,000, b. conc. on waterbound macadam paving 3.109 mi., &R 76, Section 14.13 S-181 (6), Proj. 607, Washington Co.;

O.—**H. & F. H. Hosea Co.**, 410 Elliott Ave., Cincinnati, O., CA $2,354,907, est. $2,448,600, c. conc. paving and structures 1.543 mi. USR 508 Sections (27.29-28.10, US-USG-139 (3)), Village of Evendale, Proj. 613, Hamilton Co. Bids Nov. 12. Grand total $20,786,123 CD 10/31.

▲ **Frain-Colmon Contg. Co. & Chas. N. Bohrer, Inc.**, 1595 E. Epler Ave., Indianapolis, Ind., LB $2,441,192 (7 bidders) Muddy Creek Sewage Works, Contr. 1, CINCINNATI, O. City of Akron, City Hall, Akron, O. Bids Nov. 18. CD 10/24.

▲ **Hunkin-Conkey Constr. Co.**, 1740 E. 12 St., Cleveland 14, O., LB $4,452,279, est. $3,500,000 (5 bidders) reconstr. Jefferson Ave. Bridge, CLEVELAND, O. Dpt P. Service, Louis L. Drasler, dir., City Hall, Cleveland 14, O. Bids Nov. 20. CD 11/11.

▲† **Lane Constr. Co.**, 965 E Main St., Meriden, Conn., LB $6,432,546, est. $6,182,192; Alternate Bid $6,616,081, est. $6,373,207 (10 bidders) constr. Parallel Runway Facilities, Lockbourne Air Force Base, ENG-46-022-59-9, COLUMBUS, O. U. S. Eng., 237 Fourth Ave., Huntington 18, W. Va. Bids Nov. 25. CD 10/29.

▲ **James McHugh Constr. Co.**, 6449 S. Park Ave., Chicago, Ill., LB $3,060,957 (16 bidders) Northwest Rt. superhighway, grade separation, Wabansia to Cortland St. over Ashland Ave., CHICAGO, ILL. Dpt. Purchases, City Hall, Chicago 2, Ill. Dick Van Corp., 320 N. Clark St., Chicago 10, Ill., ch. engr. Bids Nov. 20. CD 10/28;
M. J. Boyle & Co., 2519 N. Elston Ave., Chicago, Ill., LB $679,455, 3 span steel, concrete, Division St. bridge carrying Northwest Rte. super hy. over Division St. (CHICAGO, ILL.).

BUILDINGS—LB & CA

▲ **Feiner Bldg. Co.**, 20955 Ellacott Parkway, Warrensville Heights, O., Owner Builds, $4,000,000 twenty-

eight 3 story, 12 units each Ellacott Parkway APARTMENTS, both sides Ellacott Parkway, Warrensville Heights, CLEVELAND, O.

▲ Brookside Development Co., 3911 E. Broad St., Columbus, O. Owner Builds. $7,500,000, 600 low-cost HOMES Lincoln Village South, COLUMBUS, O.

▲ A. L. Jackson Co., 300 W. Washington Blvd., Chicago, Ill., CA $3,000,000, 4 story, 2 bsmnts., brick, stone MOTHER HOUSE, Willow and Waukegan Rds., near GLENVIEW, ILL. Missionary Sisters of the Holy Ghost, Willow Rd. and Waukegan Rd., Glenview, Ill. Gaul & Voosen, 165 E. Erie St., Chicago, Ill., archts.

▲ Immel Constr. Co., 562 N. Main St., Fond du Lac, Wis., CA Est. $2,000,000, COLLEGE BLDG., SILVER LAKE, WIS. Holy Family College, Silver Lake, Wis. Bids about Nov. 6. CD 10/14.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES

December 9 Texas — December 12 Kansas
December 18 Missouri

STREETS AND ROADS

December 9 Texas — December 12 Kansas
December 18 Missouri — December 19 Minnesota

HEAVY CONSTRUCTION—LB & CA

TEXAS—State Hy. Comn., Austin, M. E. Ruby & D. B. Denney, Jr., Box 96, San Marcos, Tex. CA $2,587,979, grade, structures, etc. 4.609 mi. Hy. IH 35 and US 79, Proj.1-35-3 (4) 252 & F 427 (6) Williamson Co. Bids Nov. 13. CD 11/18, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES

December 23 Washington

▲† Calif., Point Mugu—LAUNCH COMPLEX—BA 12/19—Eleventh Naval Dist., 1220 Pacific Hy., San Diego, constr. Launch Complex No. 1, Naval Missile Facility, Point Arguello, Spec. 19453-58. $5,000,000. CD 9/17/57.

BUILDINGS—BA

▲ Calif., Los Angeles—SCHOOL—BA 12/19—Bd. Educ., 1425 S. San Pedro St., constr. Mariana Del Rey Junior High School. $2,380,000. CD 12/2/57.

▲ Calif., Los Angeles—HALL OF RECORDS—BA 1/14—Clerk Los Angeles Co. for County Bd. Retirement, Los Angeles Co., Hall of Records, multi story hall of records bldg. in Los Angeles Civic Center. $10,247,000. Extended date. Neutra & Alexander, Honnold & Rex, Friend & Light, 2379 Glendale Blvd., archts. CD 11/14.

HEAVY CONSTRUCTION—LB & CA

▲† Henry Kaiser Co. & Raymond International, Inc., 1924 Broadway, Oakland, Calif. LB $8,840,000, est. $8,942,577, (12 bidders), constr. rockfill Eagle Gorge Dam on Green River with crest length of 450 ft. and height of 235 ft. above river bed, Kanasket, Inv. 59-6, WASHINGTON. U. S. Eng., 1917 S. Alaskan Way, Seattle 4, Wash. Bids Nov. 21. CD 9/17.

BUILDINGS—LB & CA

▲ W. H. Christensen, Inc., 18714 Parthenia, Northridge, Calif. LB $2,300,000 (8 bidders) Portola JUNIOR HIGH SCHOOL, LOS ANGELES, CALIF. Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Bids Nov. 21. CD 10/29.

▲ Barnhart Constr. Co., P. O. Box 127, Santa Clara, Calif. LB $2,246,025 (7 bidders) Pioneer HIGH SCHOOL addns., SAN JOSE, CALIF. San Jose Unif. School Dist., 408 Almaden Ave., San Jose, Calif. Kress & Kump, Architects Assoc., 363 Park Ave., San Jose, Calif., archts. CD 2/25.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS

December 16 Northwest Territories

BUILDINGS—LB & CA

▲ Burns & Dutton Concrete & Constr. Co. Ltd., 5720 4 St. S.E., Calgary, Alta., CA $2,080,000. POST OFFICE TERMINAL, 9th Ave. and 1st St. W., CALGARY, ALTA. Dpt. P. Wks., Hunter Bldg., Calgary, Alta. Bids Oct. 22, awarded Nov. 18. CD 10/28, under LB.

▲ Smith Bros. & Wilson Ltd., 1267 Richards St., Vancouver, B. C., CA Over $2,000,000, 1 story, rein.-con. WAREHOUSE and SERVICE BLDG., southeast corner Renfrew and Broadway, VANCOUVER, B. C. The T. Eaton Co. of Canada Ltd., 515 W. Hastings, Vancouver, B. C. C. B. K. Van Norman & Assocs., 1030 W. Georgia, Vancouver, B. C., archts. Swan, Wooster & Partners, 1334 W. Pender, Vancouver, B. C., engrs. CD 12/20/57.

(Proposal Advertisements see pp. 111 to 114)

Weldynamics

ARC WELDING AT WORK CUTTING COSTS

You can get double the life from your crawler tracks

HARDSURFACING with an automatic welder gives a carefully controlled, long lasting surface.

The Lincoln automatic process deposits a special alloy surface which will stand hard wear twice as long as original equipment. The deposited surface is so smooth that no machining is required. Lincolnweld is fast and inexpensive too.

Many repair shops and tractor dealers offer this service. But be sure to specify Lincoln hardsurfacing. Or, call your nearby Lincoln representative about setting up your own hardsurfacing unit. Write for literature.

The World's Largest Manufacturer of Arc Welding Equipment

LINCOLN

THE LINCOLN ELECTRIC COMPANY • DEPT. 3440 • CLEVELAND 17, OHIO

Good looks never carried so much weight! Chevrolet's new El Camino has a husky pickup box 76¼" long and 64¼" wide.

New 1959 Chevrolet Series 60 stake —a built-to-last hardwood body teams up with tough truck chassis components and modern valve-in-head power to put you dollars ahead on every haul!

This 1959 Chevrolet Series 100 heavyweight provides 48,000-lb. G.C.W. . . . comes equipped with big 230-h.p. Workmaster V8 engine with Wedge-Head design!

THE BEST YET OF THE BEST SELLERS . . .

CHEVROLET

TASK·FORCE 59 TRUCKS

CHEVROLET

For '59, the brightest new ideas in trucks are Chevrolet's! There's the glamorous new El Camino to set a new standard in styling . . . new features and refinements in every model to set new records for saving!

Chevy's serving up something special for '59—the soundest, savingest, sharpest looking line of haulers that ever hustled a load! For evidence, consider the dazzling all-new El Camino. It combines the slimlined beauty of the '59 Chevrolet passenger car with the ability to handle man-size hauling jobs!

Or take the pickups of Task-Force 59—a *dozen* big-bodied beauties that can fill the bill on scores of jobs with five handsome Fleetside models, seven handy Stepside pickups, including 4-wheel drive models. A new edition of the famous Thriftmaster 6, standard in light-duty models, delivers up to 10% greater fuel economy—up to 20% with new maximum economy option.*

And the picture's just as bright in the medium- and heavy-duty classes. Here, you'll find V8 power that's new and tougher built, too . . . with axles, transmissions, frames and brakes that are refined and improved to whip the toughest runs without a wheeze or whimper.

Whether your truck is a light-, medium-, or heavy-duty job, *these* are trucks you've got to see! They're on display right now at your Chevy dealer's. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

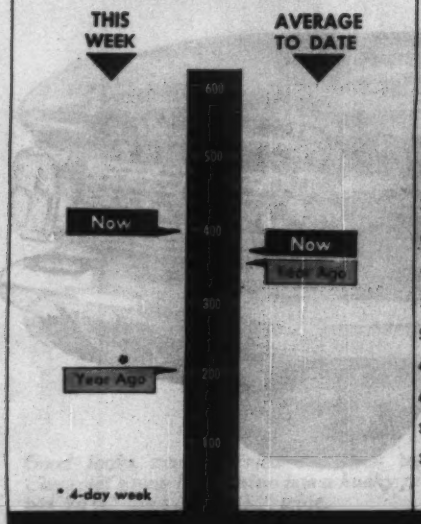
*Optional at extra cost.

NEW MIGHT, NEW MODELS, NEW MONEY-SAVING POWER!

Construction Scoreboard

ACTIVITY THIS WEEK

Contract Awards
Millions of Dollars

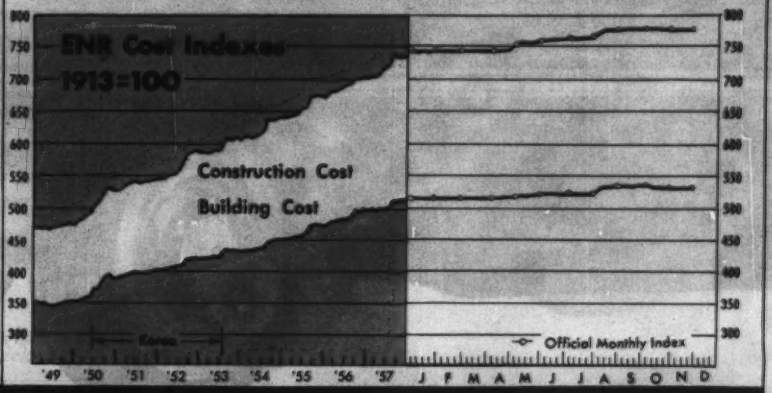


COST INDEXES AS OF NOW

ENR INDEXES (1913=100), 20-cities' average	Week of Nov. 27 1958	% Change from Oct. 30 1958	% Change from Nov. 28 1957
Construction Cost	773.81*	—0.05	+4.84
Building Cost	534.79*	—0.03	+3.59

* Official Monthly Index for December 1958.

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100. Divide Construction Cost by 4.770; Building Cost by 3.510.



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 49 wks 1958 millions	Cum. 49 wks Chge '57-'58 %
All Heavy Constr....	$399.1	$18,211.9	+6
Private	160.0	7,327.9	—9
Public	239.1	10,884.0	+19
State & Municipal..	208.7	8,179.6	+16
Federal	30.4	2,704.4	+26
By Type of Work			
Public			
Waterworks	7.7	291.7	—14
Sewerage	19.3	582.2	+12
Bridges*	14.6	679.4	—10
Highways	112.6	3,535.6	+26
Earthwork, Waterways	3.4	989.4	+5
Buildings, Excl. Housing	33.6	2,473.9	+10
Housing	21.6	1,031.1	+69
Unclassified	26.3	1,310.9	+37
Private			
Mass Housing	64.7	3,514.2	+21
Commercial	43.2	1,739.1	+4
Industrial	37.2	1,667.8	—44
Unclassified	14.9	396.6	—19

*Includes private bridges

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

NEW CAPITAL FOR CONSTRUCTION

	Week of Nov. 27	Cum. 48 wks 1958 millions	Cum. 48 wks Chge '57-'58 %
Corporate Securities..	$72.2	$4,765.7	—14
State and Municipal:			
All Except Housing.	124.2	5,799.5	+10
Housing	2.0	117.5	—25
Federal Loans	1.4	187.6	+0.4
Federal Aid	...	2,596.2	+20
Total Nonfederal	$199.9	$13,466.4	+1
Federal Appropriations:			
Projects in U. S.	...	$3,946.1	+42
Outside U. S.	...	35.2	+21
Total New Capital	$199.9	$17,447.7	+8

WAGE RATES, 20-cities average

	Dec. 1958	% Change from Nov. 1958	% Change from Dec. 1957
Common	$2.482	+0.1	+6.3
Skilled (average 3 trades)	3.764	+0.2	+4.4
Bricklayers	4.012	+0.2	+3.6
Structural Ironworkers	3.788	+0.3	+4.5
Carpenters	3.493	+0.2	+4.5
Equipment operators (average three types)	3.394	0	+4.7

MATERIAL PRICES, 20-cities average

Structural Steel (average 3 mills), per cwt	5.50	0	+4.3
Lumber, 2x4 Fir, per M fbm	115.042	—0.8	+1.1
Lumber, 2x4 Pine, per M fbm	102.417	—0.3	+2.5
Cement, bulk, per bbl	3.955	0	+0.8
Sand, per ton	2.550	0	+2.5
Ready-mixed concrete, per cu yd	13.838	0	+0.9
Gypsum sheathing, ½"x2'x8', per Msf*	62.876	0	—0.4
Fiber board sheathing, ½" sq. ed., per Msf*	71.545	+0.1	+0.3
Mineral wool insulation, 3' batts, per Msf*	70.461	0	—0.9
Crushed stone, 1½", per ton, CL	2.849	0	+1.4
Concrete blocks, sand/gravel, 8"x8"x16", each*	.229	0	0

	Nov. 1958	Oct. 1958	Nov. 1957
Brick, common per M	$37.443	0	—0.4
Lime, hydrated finishing, per ton, CL	38.713	0	+5.6
Structural clay tile, 3x12x12", per M, 2,000 up*	179.408	—2.1	—1.9
Vitrified clay sewer pipe, std 12", per ft	1.340	+0.4	+2.1
Concrete sewer pipe, 12", per ft	1.314	0	+6.7

* Delivered, truck lots

ENR INDEX REVIEW

	Construction Cost		Building Cost		Volume	
1958	1913=100	1949=100	1913=100	1949=100	1913=100	1949=100
Dec	738.08	154.73	516.27	146.76	357	103
1957 Average	723.85	151.74	508.67	144.59	517	150
1958						
Jan	743.44	155.85	516.79	146.90	368	106
Feb	743.77	155.92	515.78	146.62	446	129
Mar	744.41	156.05	516.09	146.70	520	150
Apr	745.78	156.34	516.61	146.85	585	169
May	751.57	157.56	518.62	147.42	674	195
Jun	757.31	158.76	521.09	148.13	661	191
Jul	762.52	159.85	524.29	149.03	705	204
Aug	764.44	160.25	525.62	149.41	575	198
Sep	773.47	162.15	535.02	152.09	541	156
Oct	775.30	162.53	536.53	152.51	446	129
Nov	774.12	162.28	534.96	152.07	384	111
Dec	773.81	162.22	534.79	152.02	...	...

New LIMA 64-T Truck Crane with 100' boom and 30' jib reaches out almost horizontally to pour concrete on foundation job.

LIMA 64-T . . . new 50-ton truck crane.

New LIMA 64-T Truck Crane combines high capacity, long reach, low weight

The 64-T Truck Crane with 50 ton rated capacity is the latest addition to the long line of dependable, high performance LIMA cranes. The 64-T is completely designed and built, from the ground up, by LIMA. The latest developments in high strength steels are utilized to combine high capacity and long reach, with low weight. The main frame and components of the 64-T carrier is of "T-1" steel (100,000 psi yield strength).

Goes anywhere truck can go

Mounted on 12 heavy duty tires, the LIMA-designed 8 x 4 (rear drive) or 8 x 6 (front and rear drive) carrier will go anywhere a truck can go, on-or-off highway, at speeds up to 25 mph.

The LIMA Type 64-T Truck Crane will raise a 150-ft. boom, plus 30-ft. jib (180'-0" total), from the ground without auxiliary aid.

Gantry can be lowered to cab height while boom is suspended. Rear counterweight, pin connected front and rear outrigger boxes and beams are easily removed to reduce road weight. Hydraulic power steering, precision air controls and air brakes insure easy operation to reduce operator fatigue and produce top performance.

Versatile LIMA Cranes

LIMA cranes—capacities to 110 tons crawler mounted and 70 tons rubber mounted—are highly versatile. Interchangeable front ends make them adaptable to almost every job; they can be used as cranes, shovels, draglines or pullshovels.

Learn now why LIMAS are the choice everywhere for rugged, dependable performance! See your nearby LIMA distributor or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

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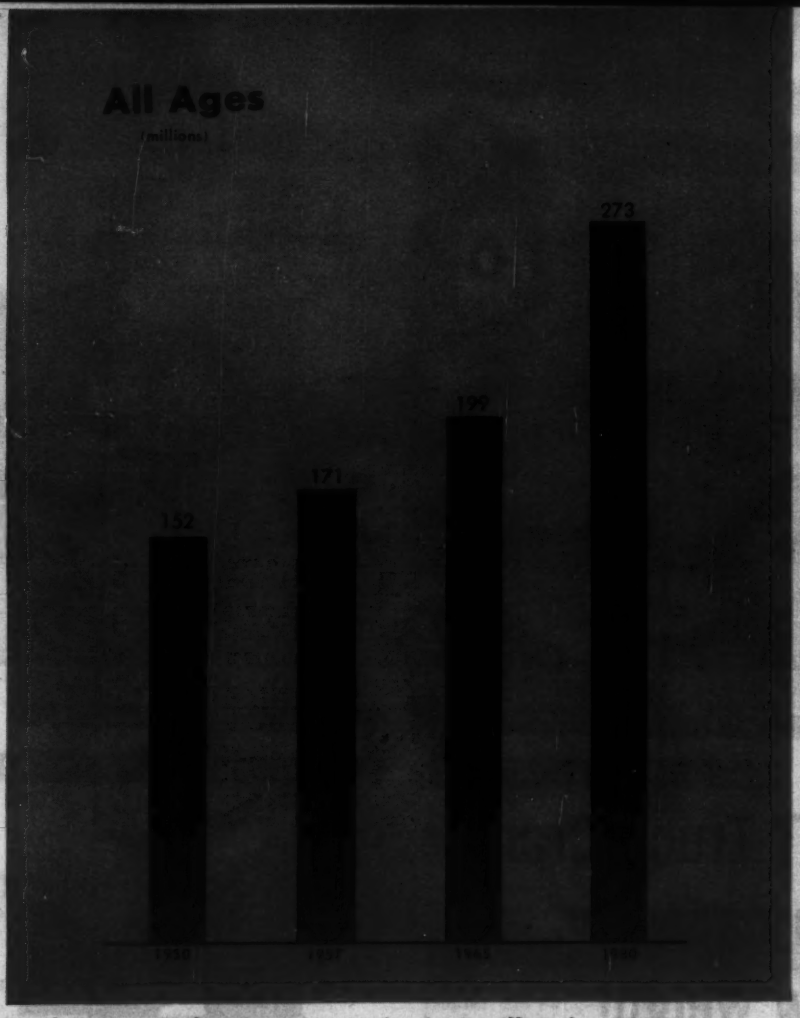
LIMA Construction Equipment Division, Lima, Ohio

BALDWIN · LIMA · HAMILTON 5839

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment



Total U. S. population may rise by 100 million by 1980.

Biggest increase will be in the school-age group.

New Population Scorecard Can

This country's booming population growth spells money in the bank for the alert construction man.

It means more homebuilding, more community facilities, more roads, more commercial buildings, more factories, more communication and transportation facilities—more of everything needed to serve a growing consumer market.

The U. S. already has passed one major population milestone; total population recently reached 175 million.

Now the Bureau of the Census has set its sights on 1980 when the U. S. may have an additional 100 million persons.

These new government figures are important to the construction industry. They show anticipated trends for total population and also for various age groups. This helps to measure the market prospects for different types of construction.

Actually, the Census Bureau has worked out four possible population projections for the period between 1957 and 1980, based on different assumptions regarding birthrates. (Census statisticians like to use the word "projections" rather than "forecasts" for these figures. The word "projections" emphasizes that the figures are not predictions but merely extensions of past trends into the future.)

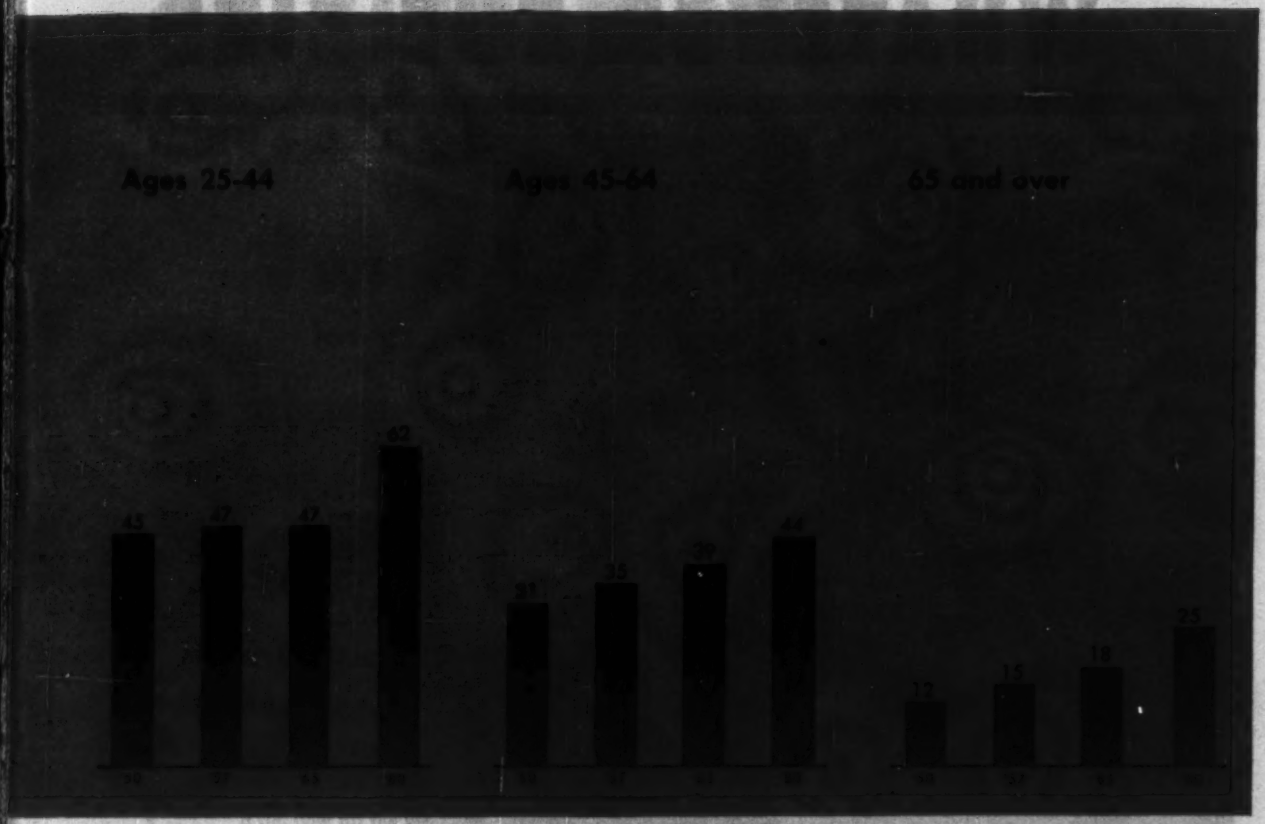
The figures used in the charts above are the highest of the four sets of projections. They are based on the optimistic assumption that birthrates will be even higher than in recent years. Earlier population projections have generally proved too conservative. They failed to take into account the growing trend toward larger families.

The other census projections, using less optimistic assumptions on birthrates, give lower totals for 1980. But the lowest estimate would still mean a rise of 60 million people, a 1980 population of 231 million.

In any case, the big margin for error is in the younger age groups. Everyone who will be in the 25-and-older bracket in 1980 is already born, and the numbers estimated for these groups are not likely to be affected much by changes in death rates or in immigration.

Here are a few of the implications for construction in population trends charted from the new Census projections:

• **Ages 0-24**—If birthrates hold up, the number of children and young people will almost double by 1980. The rise may be even greater in the high school and college age groups, 15-24. This will mean a heavy demand for school and college buildings and for recreational facilities all through the 1960s and 1970s.



Main home-buying group will not rise until after 1965.

Growing middle-age group will want better living standards.

Retired population will almost double by 1980.

Help You Strike It Rich

The upper end of this group—18 to 24—will also be providing the base for new families. The number in this bracket has not changed much in the 1950s, but it will soon begin a steep climb.

• **Ages 25-44**—This is the age group accounting for the bulk of home-buyers. It will be about one-third larger in 1980, but the rise will all come after 1965. This is a factor the construction industry will have to buck over the next half-dozen years.

Rising incomes and the possibility of more generous federal support of home-building should help counter this discouraging population factor during the 1960s. But builders will still have to adapt to a changing market. The rise will first occur at the lower end of this age group. The younger families may want more low-cost developments of the Levittown type, and more apartments, while wives continue working. Only after 1970 will there be a rise in the number of families headed by men in their 30s. These are the families that need and can afford larger houses.

• **Ages 45-64**—This group includes the heads of completed families. Generally they have stopped having children but continue to earn more income. They make a good market for upgrading living standards and for more expensive houses.

This group will add about as many people between 1957 and 1965 as it will between 1965 and 1980. This means the rate of growth will be much faster over the next half-dozen years than it will be later.

• **Ages 65 and over**—Medical progress may not show as spectacular gains in prolonging life as it has in the past 20 years, but the number of people in the older age bracket is still expected to rise two-thirds by 1980. This group will be better off financially than the retired people of earlier generations because of nearly complete coverage by social security and private pension plans. It offers a challenging market for home-builders.

The retired couples of the future will want housing tailored to their own needs. For some this will mean city apartments. Others will want small one-story houses in areas with mild climate.

Strong competition for this type of basic housing accommodation probably will come from the mobile home manufacturers.

All in all, the new population projections for 1957-1980 show a promising outlook for homebuilding and the whole gamut of construction that goes with community development. In the next few years, successful builders will have to be alert to the complex crosscurrents within various age groups. The market for construction will now be changing fast as well as growing.

(*B&F* continued on page 104)

WHATEVER THE SITE

Chicago, Ill.—Installing 24" Mechanical Joint cast iron pipe for water line rerouted due to construction of underground garage beneath Michigan Avenue.

Hickory, N. C.—High beam strength of Cast Iron Pipe makes it particularly adaptable to this type of construction on outfall sewer.

MODERNIZED **cast iron**

OR SITUATION...

there's a Cast Iron Pipe for the job

WHAT'S YOUR PROBLEM?

let us help you solve it...

6 reasons why Cast Iron Pipe is #1 choice of U. S. A.

1. **HIGH FLOW CAPACITY...** Cement lined cast iron pipe and fittings will not tuberculate . . . delivers a full flow for the life of the pipe.
2. **LONG LIFE...** 42 North American cities are still using cast iron water mains laid 100 years and more ago. Hundreds more have passed the 50 year mark.
3. **BEAM STRENGTH...** Cast Iron Pipe is inherently tough . . . stands up under heavy traffic load, soil displacement and disturbance.
4. **EXTERNAL LOAD RESISTANCE...** 6" Class 150 Pipe withstands a crushing load of 17,900 pounds per foot . . . nearly 9 tons.
5. **CORROSION RESISTANCE...** Cast Iron Pipe effectively resists corrosion . . . vital factor in its long life and dependability.
6. **TIGHT JOINTS...** A full range of leak-proof, low cost, easy-to-assemble joints for pipe and fittings are available for all conditions.

No telling where you may need to lay pipe . . .

Hilly country or flat, city street or rural lane, under superhighways, railroads or rivers.

But whatever the site or situation you *can* be sure of this: with cast iron pipe properly installed there'll be no trouble on or after the job.

Dependability, long life are built into every rugged length of cast iron pipe. Dependability *proved*, not merely promised.

THE MAN WHO CHOOSES CAST IRON PIPE TODAY WON'T PAY FOR IT AGAIN TOMORROW!

CAST IRON

Cast Iron Pipe Research Association
Thos. F. Wolfe, Managing Director
Suite 3440, Prudential Plaza, Chicago 1, Ill.

pipe FOR MODERN WATER WORKS

November Contracts Hit '58 Low

Award volume totaling $1.1 billion is 10% under last November; dip in state and local work blamed

Heavy construction contract awards in November dropped to a low for 1958.

Contracts reported by ENR totaled only $1.1 billion. That's 10% below the total for November 1957. The over-all decline resulted from a seasonal drop in public works awards.

Every type of work except commercial building and private "unclassified" slipped below the rate of awards in October.

Last month's total is not only a low for 1958, but it's the lowest November figure since 1953.

The blame rests on the state and local public works sector. This area had been offsetting the slump in federal and private awards. So when state and local public works took its seasonal tumble, the awards picture darkened.

But so far this year total heavy construction contract awards are 5% above 1957's comparable period. The cumulative 11-month total stands at $17.8 billion. The full year still gives promise of being the second biggest year on record. The peak was reached in 1956 with a record total of $21.7 billion in contract awards.

• **Bright spots**—Commercial building awards were strong last month. Their gain over October is encouraging. This type of work is expected to reach new highs in both 1959 and 1960.

Private "unclassified," the other sector showing a gain over October, was helped along by a $5.8 million grading job at Washington International Airport, Chantilly, Va. This facility is being prepared for jets (see page 21).

Private mass housing and industrial building gave poor support to November's construction market. The usual autumn surge in mass housing contracts failed to materialize. And there was a sharp drop in apartment house awards last month. But the 11-month total for apartment awards is up 64% from last year's same period. This type of building may come close to 1950's record $789 million. In the over-all picture, housing awards for November tallied $203 million. So far this year, mass housing contracts are 20% ahead of the first 11 months of 1957. But they are below the big years of 1953-'56.

However, new highs for school dormitories and housing for the aged are certain.

• **Still ahead**—Although state and local contracts dropped in November, they topped November 1957 by 3%—well under the 17% year-to-year gain scored in October.

Waterworks, sewerage and highways held up best during November. Highways topped a year ago by 59%. The 11-month total of $3.7 billion is ahead of 1957's same period by 23%.

ENR Cost Indexes Dip Slightly in December

ENR's 20-Cities Construction Cost and Building Cost Indexes are down for the second consecutive month. But the December decline is slight.

The Construction Cost Index is 773.81 for December, 0.05% below November, but 4.8% above a year ago. The Building Cost Index, at 534.79, is 0.03% below last month but 3.6% above last year. Both indexes are based on 1913 = 100.

Lumber prices are soft in some cities, with the decline now probably close to bottom. The slight turndown in lumber prices is largely offset by higher construction wage rates in three cities.

The ENR 20-cities average price for Douglas fir 2 x 4s is off 0.8% from last month. The average southern pine 2 x 4 price is down 0.3%. Biggest reduction was recorded in New York where Douglas fir 2 x 4s dropped $6.00 per Mfbm.

ENR's 20-cities average wage for bricklayers, carpenters and ironworkers is 0.2% above November. The average for common labor is up 0.1%.

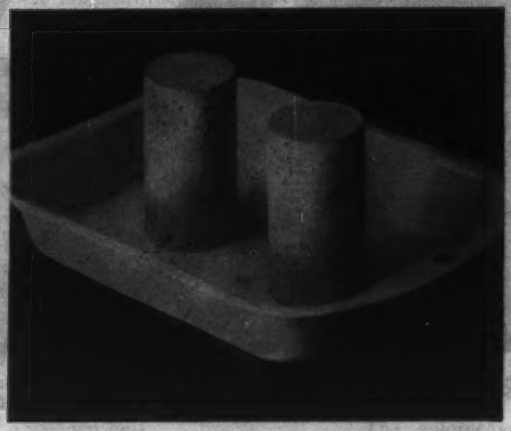
Engineering Construction Contracts for November

(Four Weeks—Thousands of Dollars (000 Omitted))

	New England	Middle Atlantic	South	Mid-West	West of Mississippi	Pac. West	Total U. S.	% Change November '57 to '58	U. S. Cumulative 1958	U. S. Cumulative 1957	% Change '57 to '58	Canada November 1958
Public Works, Total	26,594	139,259	116,588	111,283	178,858	117,598	690,241	-8	10,644,915	8,643,157	+23	64,282
Waterworks	228	5,372	4,268	1,702	1,502	4,564	17,636	-51	1,212,115	1,211,211	+0.1	1,412
Sewerage	529	9,681	4,668	10,719	3,866	6,844	36,303	-1	922,315	911,215	+1.2	3,112
Bridges	1,024	2,438	3,439	11,695	11,000	3,875	33,394	-68	854,143	778,535	+10	4,051
Earthwork, waterways	4,700	7,435	8,170	11,695	11,000	3,875	46,875	-68	854,143	778,535	+10	4,051
Streets and roads	14,700	51,601	72,777	66,000	97,000	54,000	356,078	+12	4,438,211	3,771,118	+18	34,211
Buildings: Residential	3,800	10,482	1,000	2,000	2,000	2,000	21,282	+11	1,000,000	900,000	+11	2,100
Other	10,601	37,040	18,716	10,000	39,000	42,000	161,741	+11	1,438,000	1,281,078	+12	41,000
Unclassified	1,003	7,789	13,439	10,000	14,000	4,000	54,003	+115	1,284,000	900,000	+43	4,000
State and Municipal	20,000	115,000	90,000	100,000	140,000	100,000	575,000	+5	8,000,000	6,900,000	+15	41,917
Federal	6,942	24,259	26,588	11,283	38,858	17,598	125,241	-24	2,644,915	2,743,157	-4	22,365
Private, Total	20,000	85,000	90,000	80,000	130,000	45,000	450,000	-24	7,500,000	7,000,000	+10	41,500
Bridges												
Buildings: Industrial	4,000	7,000	5,000	11,000	10,000	12,000	49,000	-20	1,000,000	1,000,000	-0	10,000
Mass housing	11,000	50,000	65,000	50,000	90,000	20,000	286,000	-17	4,000,000	3,800,000	+5	11,000
Commercial	13,000	14,000	25,000	17,000	30,000	10,000	119,000	+11	1,000,000	1,000,000	+0	14,000
Unclassified	1,000	14,000	5,000	2,000	5,000	3,000	30,000	+50	500,000	200,000	+150	4,000
Total Nov., 1958—4 weeks	73,000	292,000	196,000	170,000	313,000	163,000	1,111,000	-10				105,000
Oct., 1958—5 weeks	102,000	418,000	287,000	281,000	322,000	213,000	1,623,000					150,000
Nov., 1957—4 weeks	80,000	340,000	190,000	207,000	305,000	189,000	1,231,000					80,000
Eleven Months—1958	1,187,000	4,488,000	2,488,000	2,218,000	3,441,000	2,627,000			17,819,000		+6	1,400,000
Eleven Months—1957	1,186,000	4,482,000	2,117,000	2,218,000	3,202,000	2,648,000				17,013,000		1,110,000
% Change '57 to '58	+0	+0	+17	+0	+7	−1						+26

Engineering News-Record reports contracted U. S. Construction projects of the following minimum costs—Waterworks, excavation, drainage and irrigation, $41,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $244,000.

BRIXMENT MORTAR
Is More Durable



To compare the durability of Brixment mortar and ordinary cement-and-lime mortar, make a cylinder of each, let them "cure" for a month, then freeze and thaw them for forty or fifty times, with a little water in the pan (the freezing unit of your electric refrigerator will do). See the difference with Brixment mortar!

—AND DURABILITY MEANS PERMANENT STRENGTH AND BEAUTY

For permanent strength and beauty, mortar must be *durable*—must be able to withstand the alternate freezing and thawing to which it is subjected many times each winter.

Brixment mortar *is more durable.* This greater durability is due partly to the strength and soundness of Brixment mortar, and partly to the fact that an air-entraining water-repelling agent is incorporated into Brixment during manufactqre. This helps prevent the mortar from becoming saturated — therefore protects it from the destructive action of freezing and thawing.

Walls built with Brixment mortar therefore *retain* their original strength and appearance — even parapet walls and chimneys, where exposure is particularly severe.

LOUISVILLE CEMENT COMPANY, LOUISVILLE 2, KENTUCKY

Cement Manufacturers Since 1830

EXPRESS PAVER resurfacing 15 miles of U. S. Highway 70 south of Huntington, Tennessee. Warren Brothers also used Blaw-Knox Wideners on their portion of the $1,200,000 contract. Express Paver is laying upwards of 1,000 tons per day in a 1½ inch layer. Job Superintendent Bragg is shown at left and General Superintendent Duckworth at right.

"We're 50% ahead of schedule because of the speed of this Blaw-Knox Express Paver"

"Despite the difficulty of this particular mix, our Blaw-Knox unit is laying up to 142½ tons per hour. Although we've had weeks of bad weather, we're 50% ahead of schedule on the maximum 250-day contract time," says R. F. Bragg, Job Superintendent on the Warren Brothers project.

"The quality of roadway is superior to that layed by crawler-mounted equipment. And the Blaw-Knox longer wheelbase reduces waves in the pavement that are sometimes felt when driving over asphalt roads laid by shorter wheelbase pavers. Rubber tires make it possible for us to work faster in completing the major moves that the machine makes, and it paves up to 20% more in the same amount of time," adds Ray Duckworth, General Superintendent.

Here is another instance of proved advantages —faster, better quality paving with freedom of movement—that contractors everywhere are experiencing with the new Blaw-Knox Express Paver. See your nearest Blaw-Knox Distributor for a technical report on this project, or write direct. There's no obligation, of course.

BLAW-KNOX

BLAW-KNOX COMPANY

Construction Equipment
300 Sixth Avenue
Pittsburgh 22, Pennsylvania

Court Tells NLRB to Settle Disputes

Refusal to enforce a negative labor board decision may lead to changes in jurisdictional procedures

The time may come when contractors plagued by jurisdictional disputes can force the National Labor Relations Board to settle such disputes on the basis of their merits.

Should this occur, the board will be required to decide which union should do the disputed work—at least in those cases where the construction industry's voluntary settlement procedure does not apply.

For the second time in as many years, a federal court has ruled that the NLRB is failing to comply with the law when it issues a jurisdictional decision of a negative rather than an affirmative nature.

It is not enough to conclude that the union that pulls a jurisdictional strike cannot legally claim the disputed work, the court said. The question the board must answer is this: Who should do the work?

The ruling came down last month from the Seventh Circuit Court of Appeals in an Indianapolis dispute between carpenters and coopers over erection of a wooden tank.

The court refused to enforce an NLRB decree ordering the carpenters to halt its strike over the disputed work. It based its refusal on the fact that the decree was defective because the board had not decided whether the work should be done by carpenters or coopers. The board had merely said that the carpenters were "not entitled" to force or require the contractor to assign the disputed work to them.

The decision represents another stepping stone in the development of the law on jurisdictional disputes. Coupled with a similar ruling by the Third Circuit Court of Appeals in a Philadelphia dispute between pipefitters and riggers, it pushes the final decision on the extent of the NLRB's role in jurisdictional disputes closer to the U. S. Supreme Court.

• **Stopping strikes**—Until the law is clarified contractors must be content with only half an answer to two vital questions:

• Who decides that a particular work assignment is correct?

• How do you prevent a union from striking to make you change it?

The law is clear. Such strikes are illegal. The Taft-Hartley Act makes them unfair labor practices. But the problem is enforcement.

The NLRB solved part of the problem earlier this year in a decision on the carpenters' acoustical ceiling dispute with the lathers (ENR Jan. 30, p. 78).

Two principles were then established by the board. But they apply only to disputes involving unions and contractors who have agreed to, or who are bound to, abide by the voluntary settlement procedure of the National Joint Board for the Settlement of Jurisdictional Disputes.

The first principle is that the NLRB will not decide which disputing union should do the work; a work assignment or job decision can be obtained only from the Joint Board.

The other is that building trades unions can no longer ignore with impunity decisions of the Joint Board; the NLRB will still entertain, although it will not decide, disputes that go before the Joint Board. And it will use its injunctive powers to enforce Joint Board decisions.

The enforcement problem still remains unsolved in cases that do not go to the Joint Board. That is the problem presented by the Indianapolis case.

• **Reluctant board**—The NLRB has always been reluctant to get into the business of making work assignments. It has consistently interpreted the law in a way that avoids this.

Work assignments, it says, are a function of management. The law imposes only one restriction: A work assignment must not violate an NLRB order or certification that gives the striking union a right to perform the work.

The board has added one more restriction: A job assignment should not violate a valid contractual right of the striking union, such as a labor contract clause on work assignments.

If none of these violations has occurred, the board feels it need go no further. In one type of case—where the Joint Board has jurisdiction—it sits back and lets the Joint Board handle the dispute. In the other type, it finds that the striking union has no claim to the work, pegs the strike as an unfair labor practice and orders the union to halt the strike.

• **Court wants more**—Two circuit courts say this is not enough. They reason that the law contemplates "the actual settlement of jurisdictional disputes" and that an NLRB decision stating which union should perform the work is essential to a settlement." The Third Circuit Court, which has been the most outspoken, has said the law is "phrased as a mandate" and requires the board "to adjudicate the merits" of a dispute.

The NLRB has amended its administrative regulations since the Philadelphia and Indianapolis disputes arose.

The old regulations, which the board did not follow, did require the NLRB to decide which trade should perform the disputed work.

The new regulations, effective last February, omit this requirement. They merely require that the board "determine the dispute or make other disposition of the matter."

Effect of the change is to pose two more questions for the courts:

• What has to be done to "determine" a dispute?

• Do the regulations meet the requirements of the law?

• **What happened?**—The Indianapolis dispute followed a familiar pattern.

J. Emil Anderson and Son, general contractors on an Indianapolis project, sublet most of the work to Fruin-Colnon Contracting Co., which had a labor contract with the carpenters. Construction of an outside wooden tank was sublet to Wendnagel & Co., which had a labor contract with the coopers.

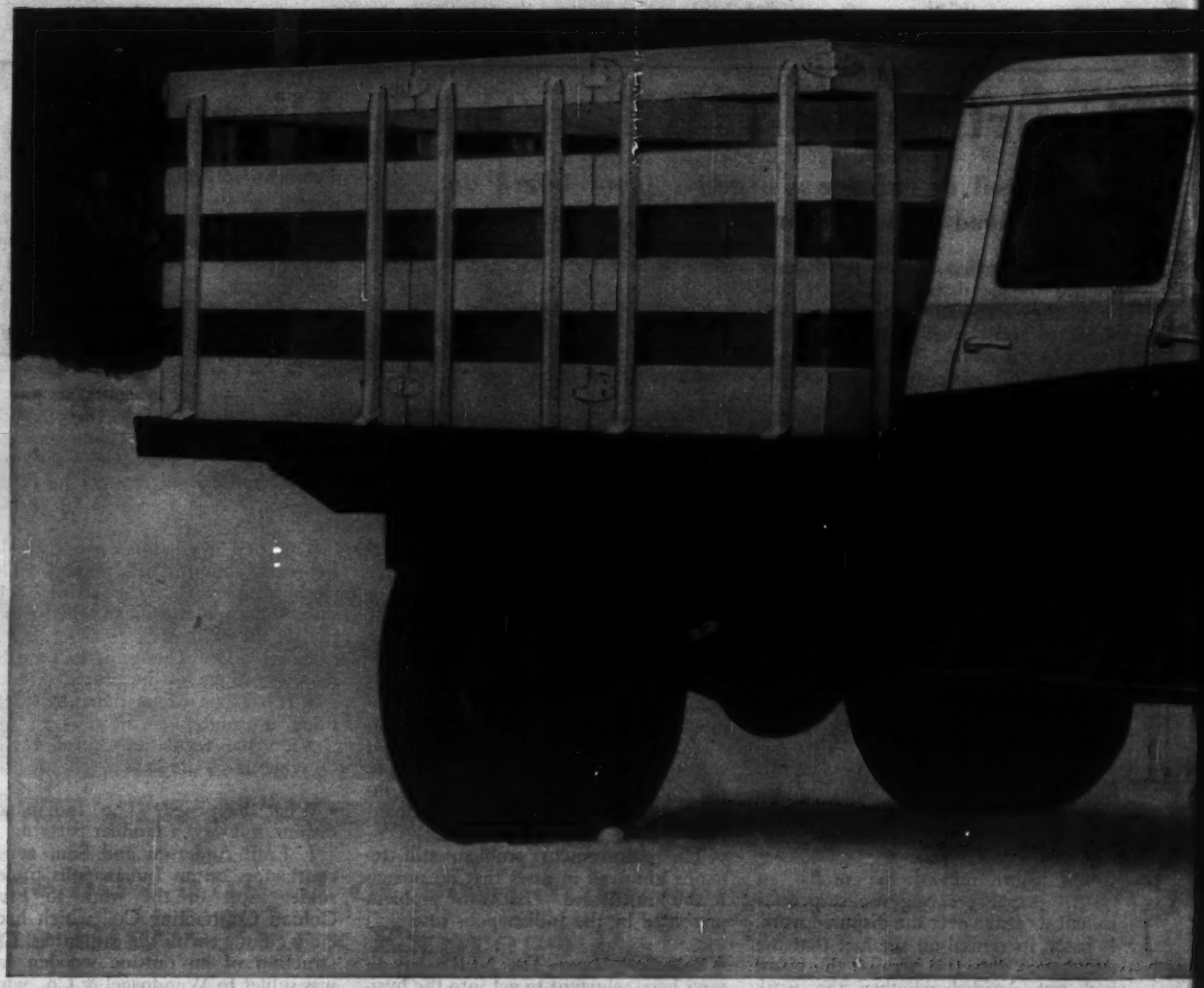
Coopers were employed on the tank work. The carpenters wanted it, protested the assignment and struck. The dispute did not fall within the jurisdiction of the Joint Board.

Wendnagel filed unfair labor practice charges against the carpenters. NLRB found that the carpenters were "not entitled" to strike for the work and ordered them to "refrain from forcing or requiring" Wendnagel to assign it to them.

The board then asked the court to enforce the order. The court refused to enforce it because the order did not settle the basic dispute between carpenters and coopers.

The latter restriction is rather subtle because the NLRB has held that a union bound by the Joint Board cannot contract away that obligation. The restriction appears to apply only when the dispute is not within the Joint Board framework.

(Labor continued on page 110)



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INTERNATIONAL Trucks with Travel-Crew Cabs carry men and materials to the job site in one operation. It's always fair weather inside the cab no matter how foul it is outside.

Versatile INTERNATIONAL Trucks with six-man Travel-Crew Cabs have third door access to rear seat for easy in and out. Both back and front seats are over 5-ft. wide for maximum driver and passenger comfort. Rugged INTERNATIONAL chassis and cab are factory matched and warranted . . . sold at one low complete unit price. Compact-design and conventional models including 6-wheel models with GVW ratings to 33,000 lbs. See your INTERNATIONAL Truck Dealer, today!

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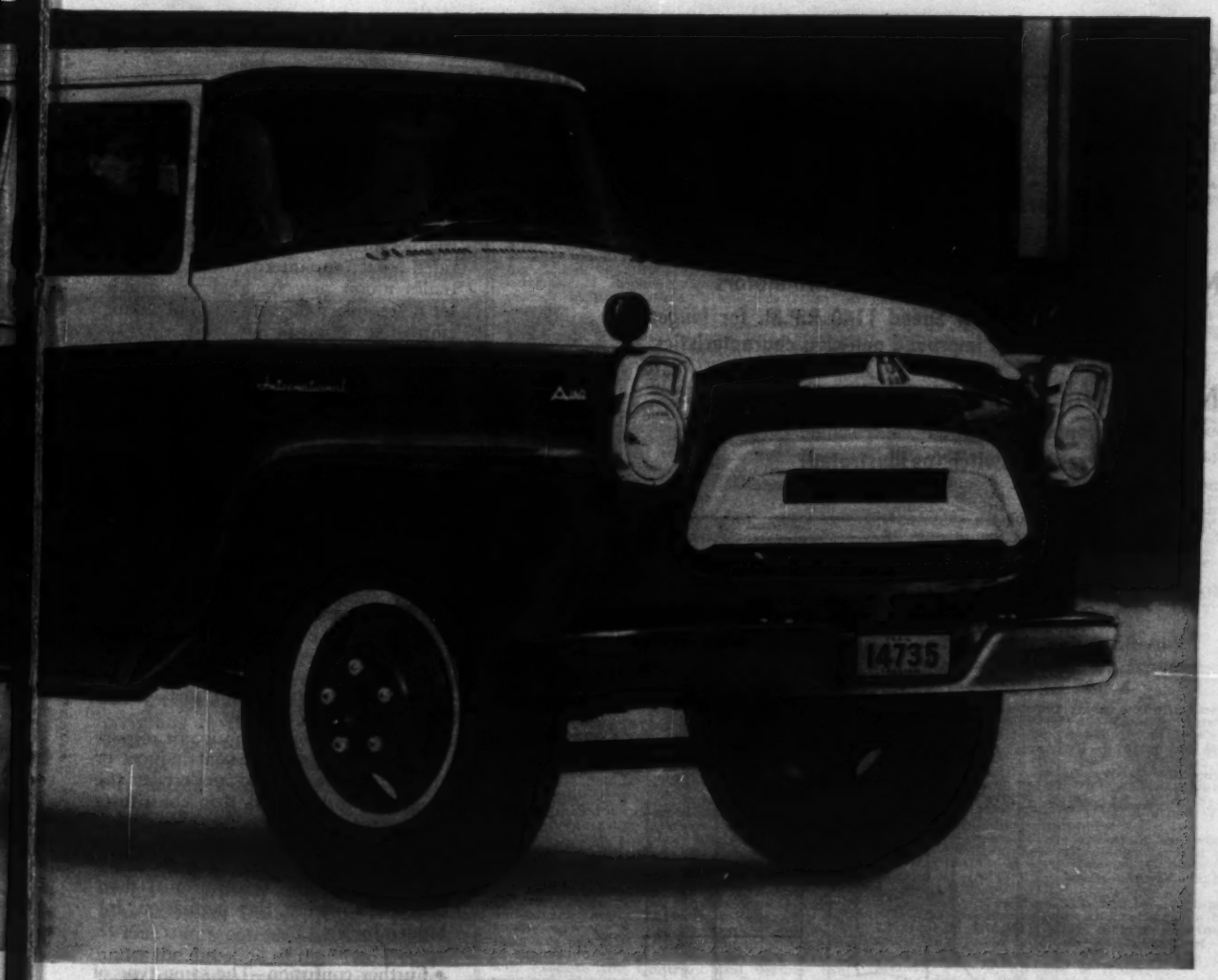

Here's the all-purpose four-wheel-drive INTERNATIONAL Travelall. Take it anywhere on any construction job—you'll find a dozen new uses for it every day. The weather-tight Travelall has more loadspace than other wagons. It carries 8 husky construction workers or a full load of tools and equipment fully weather-protected all day. On or off the road the Travelall has plenty of power and traction. Its accurate, positive steering and road-hugging qualities makes all driving easier and safer. See and drive a four-wheel-drive Travelall soon.

INTERNATIONAL HARVESTER COMPANY, CHICAGO
Motor Trucks • Crawler Tractors
Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors

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SPECIFY "weil"

weil Submersible Sewage and Sump Pumps have been in use since 1951. There is no substitute for experience.

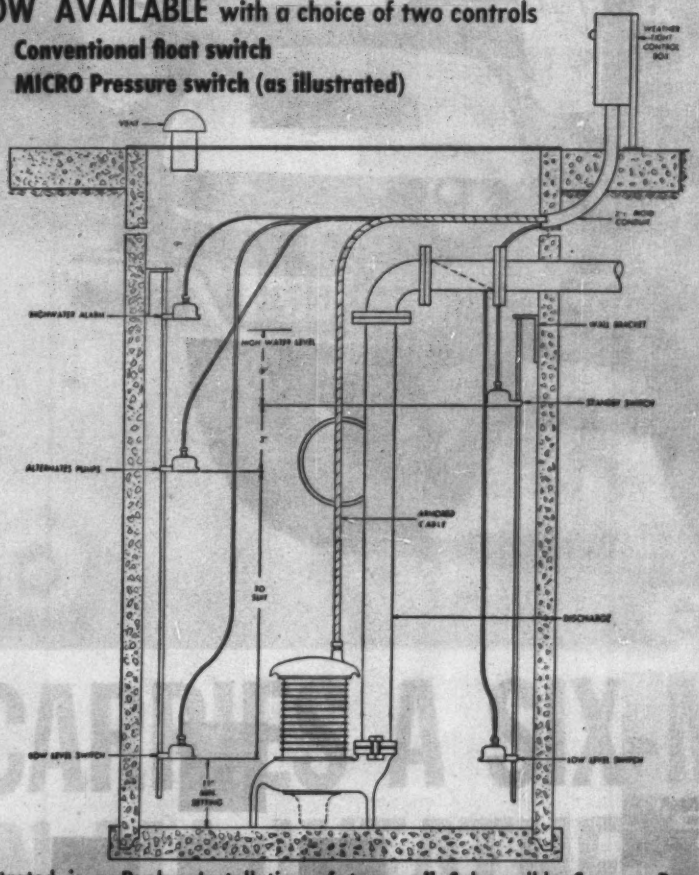
NOW AVAILABLE in a choice of two motors

1750 R.P.M. and Low Speed 1140 R.P.M. for longer life, less wear and improved non-clog characteristics.

NOW AVAILABLE with a choice of two controls

Conventional float switch

MICRO Pressure switch (as illustrated)



Illustrated is a Duplex Installation of two **weil** Submersible Sewage Pumps employing MICRO Switch controls to start and stop pumps; to alternate pumps; and to provide for high water alarm. Note the ease with which switches are positioned (or changed) to control water levels. The Submersible MICRO Switch has no exposed moving parts, needs no servicing and coupled with the **weil** Submersible Pump provides an extremely efficient non-clog trouble-free pumping system.

weil Submersible Pumps are manufactured in discharge sizes of 3" to 6" and capacities to 2000 G.P.M. There is a **weil** Submersible Pump to meet all requirements.

Send for Bulletin SE-860, SE 862 and SE 865 (505) for complete engineering information.

weil PUMP COMPANY

1528 North Fremont St. Chicago 22, Ill.

Boycott Liability

New court decisions may increase pressure for changes in the law

A National Labor Relations Board trial examiner in San Francisco has ruled that an international building trades union may be held responsible for a secondary boycott without taking affirmative action of any kind.

This ruling enlarges the dimensions of the secondary boycott ban and underscores the confusion that still exists despite 11 years of litigation under the Taft-Hartley Act.

• **Union responsibility**—The trial examiner used a union constitutional provision as one of the grounds for holding the United Brotherhood of Carpenters liable for a secondary boycot conducted by one of its locals.

The provision instructs union members to handle only prefabricated products made by union carpenters. The boycott took the form of a refusal to handle certain doors being installed on a school construction job.

Under the law a union is not responsible for a boycott unless it induces or encourages workers to undertake the strike or work refusal that constitutes the boycott. Some visible form of persuasion has, in the past, generally been held essential. Now the San Francisco examiner says the constitutional mandate adds up to the persuasion forbidden by law.

• **Further confusion**—The same type of confusion is reflected in a new federal court decision on an Indianapolis dispute (see page 107).

In that case, a general had two subs—one for the major construction work and one for erection of an outside wooden tank. The tank sub hired members of the coopers union. Carpenters working for the other sub wanted the work and struck the job.

The carpenters were charged with a secondary boycott on the theory that they were trying to force the general to fire the tank sub and get one that would hire carpenters. The NLRB, following the Denver Building Trades case, upheld the charge.

The federal court said the board was wrong because the object of the strike was to force the tank sub to hire carpenters rather than to force the general to discharge the sub.

• **Need a change?**—The two cases show that most of the boycott confusion comes in trying to apply the test set up

by the law to determine if an illegal boycott exists. The law requires three things:

- A strike or a refusal too handle certain products.
- Union inducement of the strike or refusal.
- An attempt, through the strike or refusal, to force an employer to stop using certain products or to quit doing business with another person.

The resulting confusion is one of the reasons why contractors and unions are trying to get the law amended.

Contractors Pay Up

Enforcement drive brings back pay to Kentuckians

Kentucky's prevailing wage law is being enforced for the first time.

A total of $16,000 in back pay for construction workers has already been retrieved from 14 contractors. The amount may soon exceed $50,000.

The Kentucky law, similar in nature to the federal Davis-Bacon Act, requires contractors on public works projects to pay workers wages at least equal to those prevailing in the area for the type of work performed.

Most of the Kentucky contractors so far charged with violation of the law are in highway or general construction work. All the alleged violations involved underpaying nonunion workers or members of united construction workers—a division of District Fifty in John L. Lewis' United Mine Workers.

The state's enforcement campaign is under the direction of the State Department of Industrial Relations, which says it has made no attempt to enforce the law before.

Investigations based on spot checks and complaints indicate that some contractors have been paying "less than the prevailing wage rate for 40 years," the department reports.

Iron Workers End Strike With Three-Year Contract

A new three-year labor contract calling for hourly wage increases totaling 32 cents has ended a 46-day strike by iron workers against 11 steel fabricating plants in Buffalo, N. Y.

The contract grants an immediate wage increase of 11 cents an hour, 10 cents more on October 1, and a final increase of 11 cents in October, 1960.

The union's health and welfare program has been improved and changes have been made in the contract's vacation and seniority provisions.

A common violation has been failure to post prevailing wage scales.

OFFICIAL PROPOSALS

Bids: January 6, 1959

City of Rochester, New York

NOTICE IS HEREBY GIVEN that sealed proposals for "Main Sewage Treatment Plant Additions, Stage 2—Sludge Disposal Building", consisting of the construction of the Sludge Disposal Building, stack and auxiliary structures to house sludge disposal equipment at the Main Sewage Treatment Plant, will be received by the City of Rochester Purchasing Agent at his office, Room 36, City Hall, No. 20 South Fitzhugh Street, Rochester 14, N. Y., until 11:00 o'clock A.M. Eastern Standard Time on January 6, 1959 at which place and time they will be publicly opened and read aloud. The proposals shall be for furnishing all material, equipment, and labor for the construction and erection of structures and appurtenances, exclusive of sludge dewatering and incinreation equipment, in accordance with the Plans, Specifications and other Contract Documents, prepared by Nussbaumer, Clarke & Velzy, Consulting Engineers for the City of Rochester.

The work is subdivided into five separate Contracts, as follows:

Contract 2A—General Construction and Equipment
Contract 2B—Stack
Contract 2C—Piping and Plumbing
Contract 2D—Electrical Construction
Contract 2E—Heating and Ventilating

Contractors may submit proposals for any one, all five, or any combination of the Contracts.

These Plans, Specifications and other Contract Documents may be examined at the office of Nussbaumer, Clarke & Velzy, 327 Franklin Street, Buffalo 2, New York, and 500 Fifth Avenue, New York 36, N. Y., and may be examined and copies thereof may be obtained at the office of the Purchasing Agent. One copy of the said documents may be obtained upon payment of $50.00 deposit; any bidder returning such copy in good condition within thirty (30) days following the opening of proposals will be refunded $50.00 and any non-bidder so returning such copy will be refunded $25.00.

The City of Rochester reserves the right to reject any or all proposals, and to waive any informalities, and to make an award to other than the low bidder, should the best interest of the City thereby be promoted.

Proposals shall be made on the form provided in the Contract Documents, and each propasal shall be accompanied by a certified check made payable to the City of Rochester, N. Y., in an amount not less than five pre cent (5%) of the total amount of the proposal, conditioned that the bidder will execute the Contract and deliver the required Performance Bond for the proposed work within ten (10) calendar days after the date of written notice that his proposal has been accepted. For proposals with total amounts in excess of $2000,000, or proposals for work financed or aided by any Federal or State agency, a bid bond in the amount of five (5) per cent of the amount of the proposal, in proper form, executed by a surety company acceptable to the City, will be accepted in lieu of the aforesaid certified check.

A bidder may not withdraw his proposal within forty-five (45) calendar days after the opening of proposals, but may withdraw his proposal at any time prior to the scheduled time for the opening of proposals.

Kenneth E. Punnett
Purchasing Agent
City of Rochester, N. Y.

Dated: November 25, 1958

Bids: January 8, 1958

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
For Furnishing and Delivery of
Intake Gate Fixed Hoists for
Tuscarora Power Plant
Specifications No. PA-N-23019
Niagara Contract No. NP 32

NOTICE TO CONTRACTORS: The Power Authority of the State of New York will receive sealed proposals for the furnishing and delivery thereof f.o.b. University Siding, Tuscarora Power Plant Area, Niagara Falls, New York, of 24 intake gate fixed hoists for the Tuscarora Power Plant in Lewiston, Niagara County, New York, until 10:26 AM Eastern Standard Time on the 8th day of January, 1959, at the Authority's Office, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place proposals will be publicly opened and read aloud.

Bids will be received for furnishing and delivering of twenty-four 65 ton capacity intake gate hoists complete with appurtenances for the 24 intake gates for the Tuscarora Power Plant. First delivery will be required June 1, 1960.

All work shall be completed on or before September 1, 1960.

Plans, Specifications and Proposal Forms for the work may be obtained from the Power Authority of the State of New York, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Ten ($10,000) Dollars per initial set of contract documents, and Five ($5.00) Dollars per set for additional sets no part of which will be refunded. Plans, Specifications and Proposals Forms for the work will be on file in the Authority's Office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

Bids: May 7, 1959

Federation of Malaya Cameron Highlands Scheme Contract No. 4

Tenders are invited from manufacturers for the supply of Hydro-Electric Power Plant to be installed on behalf of the Central Electricity Board, Federation of Malaya.

The Contract now advertised will comprise 3 No. 25 MW Pelton Waterwheel driven Alternators, 2 No. 10 MVA Synchronous Condensers, Cranes, a Road Vehicle and ancillary equipment.

A short precis of the extent of the work for which offers are invited may be had on application to Messrs. Preece, Cardew & Rider, 8, 10 & 12, Queen Anne's Gate, London, S.W.1.

Tender documents which will be available after 7th December, 1958 and returnable by 12 noon on 7th May, 1959, may be obtained from the same address on receipt of a deposit by cheque for £20 in favour of Messrs. Preece, Cardew & Rider.

The deposit will be refunded on receipt of a bona fide Tender and return of all documents to be returned.

At a later date offers will be invited for Switchgear, Transformers, Cables and Transmission Lines. Persons interested in such should NOT now apply, but await further advertisements.

The Central Electricity Board do not bind themselves to accept the lowest or any Tender, nor will they be responsible for any costs incurred by Tenderers in making their Tender.

Bids: December 18, 1958

Maumee Bay Marina

Sealed proposals for this project will be received by the Toledo Metropolitan Park Board at the office of the County Commissioners, First Floor, Lucas County Court House, Toledo, Ohio, until 2:00 o'clock P.M., Eastern Time, on Thursday, December 18th, 1958, at which hour the bids will be publicly opened and read.

The work involves three (3) separate contracts, i.e.:

Contract No. M1—Dike Construction of approximately 3,000 feet
Contract No. M2—Dredging — 67,000 cubic yards
Contract No. M3—Construction of shore facities, such as ramps, roads, etc.

Copies of the plans, proposal forms and other documents can be seen at the office of the Toledo Metropolitan Park Board, 4th Floor, Lucas County Court House, Toledo, Ohio, and can be obtained at that office upon deposit of $10.00.

J. Max Shepherst,
Director-Secretary.

(Continued on the following page)

OFFICIAL PROPOSALS

Bids: December 11, 1958

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, Canal Law and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A. M., eastern standard time on the 11th day of December 1958, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following Projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, G. L. Nickerson, District Engineer, 333 Broadway, Albany 1, New York						
Albany & Schenectady (Int. Tour. Rte. 890)	FISH 58-20 FAC 58-26P ST 58-2	City of Schenectady: Crosstown Connection, Interstate Route Connection 550 (Schenectady Crosstown to Thruway) N.Y.S. Thruway, Mohawk Section: Interchange No. 25 Connection Proj. U-I-IG-323(13)	2.22 (1.81 Acc.)	9" Cem. Conc. Pavt. 2 @ 24' Var. Wide=2.06 Miles; Acc. Rd.=1.81 Mi.; Conc. Pavt. Temp. Asph. Conc.=0.07 Mi.; Misc. Work=0.09 Mi.; 3 Hy. Sepa. Comp. I-Beams 231', 191' and 205.3'	$160,000 Plans $5	$2,861,000
DISTRICT No. 2, L. Ketchum, District Engineer, 109 No. Genesee Street, Utica 1, New York						
Oneida (Rte. 49)	FARC 58-172	Mohawk River-Rome, S.H. 560 Mohawk River Road-Floyd, S.H. 295 Mohawk River Road-Marcy, S.H. 296 Proj. U-518(6) & F-518(6)	6.37 (3.03 Acc.)	9" Cem. Conc. Pavt. 2 @ 24' Var. Wide=6.23 Miles; Misc. Work=0.14 Mi.; (Acc. Rds.=1.79 Mi. Conc. & 1.34 Mi. Asph. Pavt.) 2 Hy. Sepa. Prestres. Conc. Beam 228.3' & 230.8'; 1 Br. Reinf. Conc. Box 24'; 1 Br. Prestress. Conc. Beam 211.5'; 1 Br. Reinf. Conc. Slab 24.8'	$285,000 Plans $5	4,776,000
Oneida (Rte. 13)	FARC 58-174	South Bay-Vienna, S.H. 8219 Proj. F-384(5)	0.32 (0.25 Acc.)	9" Cem. Conc. Pavt. 24' Wide=0.32 Mi.; (Acc. Rds.=0.25 Mi. Asphalt Concrete); Plate Girder Br. 440'	$40,000 Plans $5	730,000
DISTRICT No. 4, B. F. Perry, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Seneca	FAC 58-27	City of Geneva: Lake Front Arterial, Pt. 2	2.23	9" Cem. Conc. Pavt. 2 @ 24' Var. Wide=2.74 Miles;	$130,000	2,350,000
Ontario (Rtes. 5 & 20)	FASH 58-22	Geneva Lake Front East Highway Connection Proj. U-UG-452(7)	(1.17 Acc.)	Asph. Conc.=0.24 Mi.; Gravel Top Crse.=0.08 Miles; Misc. Work=0.34 Mi.; Ped. Overpass Thru Girder 417.7'; RR Sep. Deck Girder 211.8'	Plans $5	
Livingston (Rte. 5)	RC 58-171	Caledonia-Avon, S.H. 5373 (Br. No. 5)	....	Repairing-Replacing Deck, Cleaning & Painting a Truss Br. 3 Spans, 293.7'	$8,000 Plans $5	145,000
Monroe	FATS 58-1	Rochester City: Inner Loop (South Ave. to George St.) Proj. U-231(12)	0.53	Furnish & Install Traffic Signs	$1,500 Plans $5	26,000
Wyoming	FASSH 58-27	Arcade-Java Center Proj. S-290(3)	3.24	Bit. Mac.=3.19 Mi.; Misc. Work=0.05 Mi.; Prestress. Conc. Beam Br. 46.7'	$60,000 Plans $5	1,094,000
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, State Office Bldg., 65 Court Street, Buffalo 2, New York						
Erie (Rte. 324)	FATC 58-3	Sheridan Drive, S.H. 9216 Proj. U-1123(2)	6.86	Traffic Signal System	$12,000 Plans $5	216,000
Erie & Niagara	M 58-17	Erie Canal Bridge E-247 at Delaware Ave. in Cities of Tonawanda & North Tonawanda	0.10	Br. Repairs; Remove & Replace Conc. Deck and Wear. Crse.	$3,500 Plans $10	64,000
DISTRICT No. 6, James H. Thomas, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Chemung	FASS 58-27	Big Flats-South Corning, C.R. 10 Proj. S-525(1)	0.42	Bit. Double Surf. Treat. Stone Comp. Weld Plate Girder Br. 587.9'	$28,000 Plans $5	514,000
Chemung & Steuben (Rte. 17)	FARC 58-170	Elmira-Horseheads Connection Pts. 1 & 2, FASH 53-5 & S.H. 5162; Horseheads Village, FASH 53-5 & S.H. 5162; Horseheads-Corning, S.H. 358; East Corning-Horseheads, Pt. 2 & Pt. 1, FASH 53-5 & FASH 55-5 Proj. U-221(10), U-661(6) and F-661(6)	14.04	Chain Link & R.O.W. Fencing	$7,000 Plans $5	120,000
Orange & Ulster (Rte. 300)	FARC 58-173	Wallkill-Newburgh, Pt. 1, S.H. 1417 Newburgh-Shawangunk, S.H. 161 Proj. F-416(4)	2.07	Asphalt Concrete	$21,000 Plans $5	384,000
Ulster (Int. Tour. Rte. 587)	FISH 58-18	Interstate Route Connection 530 (City of Kingston) (Sawkill Road Highway Grade Separation) Proj. I-1150(3)	0.10	Ashph. Conc. Hy. Sep. Prestress. Conc. Beams 179'	$13,000 Plans $5	209,000
Westchester (Rte. 118)	FARC 58-97	Pines Bridge-Yorktown Heights S.H. 148 Yorktown Heights-Putnam County Line, S.H. 149 Proj. S-150(2)	0.97	9" Cem. Conc. Pavt. 24' Wide=0.92 Mi.; Misc. Work=0.05 Mi.	$18,000 Plans $5	334,000
DISTRICT No. 9, Joseph C. Frederick, District Engineer, 71 Frederick Street, Binghamton, New York						
Chenango (Rte. 12)	FAC 58-18	City of Norwich: Arterial Highway (South and North Broad Street). Proj. U-878(3)	1.02	Asph. Conc. Ty. 2B=1.01 Mi. Misc. Work=0.01 Mi.	$40,000 Plans $5	733,000
DISTRICT No. 10, M. E. Goul, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Bronx (Int. Tour. Rte. 95)	FINETC 58-8	Interstate Route Connection 511 New York State Thruway—New England Section—Sub. NE-8 (Westchester Ave. to New York City Line) (Cont. 2B) Proj. I-1063(21)	3.54	Landscaping, Fencing and Misc. Work	$62,000 Plans $5	1,122,000
Queens (Int. Tour. Rte. 495)	FICE 58-2	Interstate Route Connection 513 Clearview Expressway (Horace Harding Exp. to 32d Avenue) (Cont. 1E) Proj. I-1112(8)	1.95	Demolition of Buildings	$6,000 Plans $10 Large Size Only	113,000
Queens (Int. Tour. Rtes. 78 & 495)	FIHHE 58-2 FICE 58-3	Interstate Route Connection 514 Horace Harding Exp. Sect. 11 (190th St. to Oceania St.) Interstate Route Connection 513 Clearview Exp. (73d Ave. to 56th Ave.) Proj. I-862(16) and I-1112(9)	2.64 (5.35 Acc.)	9" Cem. Conc. Pavt. 2 @ 36' Var. Wide=1.58 Miles; Grad. & Drain=0.74 Miles; Misc. Work=0.32 Mi. (Acc. Rds.=2.97 Mi.; Conc. Conc. & 2.38 Mi.; Asph. Con. Pavt.) Ped. Overpass W.F. Beams 309.3'. 9 Hy. Sepa. Comp. W.F. Beams 177.3', 167.3', 142', 127.5', 145.8', 167.2', 82.3', 125.2' and 203.6'	$370,000 Plans $10	12,145,000
Suffolk	FASS 58-28	William Floyd Parkway Extension Pt. 1, C.R. 46-A Proj. S-SG-531(1)	4.70	Asph. Conc.=4.62 Mi.; Misc. Work=0.08 Mi.; 1 RR Sep. Reinf. Conc. Slab 169'	$103,000 Plans $5	1,872,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal. Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: January 7, 1959

Invitation to Tender
Negril Development Scheme

Tenders are invited from suitably qualified civil engineering contractors for the construction of the works briefly described herein—

The works are to consist of 10 miles—more or less of roadway having a carriageway of 24 ft. with an eight foot stabilized shoulder on each side of the roadway together with drainage works comprising 4.6 miles more or less of cut-off canal and improvement and by-pass works to two rivers.

These works are to be undertaken under a deferred payment scheme which will be operated over a period of five years. Tender Documents and Plans may be obtained on application to the Chief Engineer (Civil), Public Works Department, Kingston 10, Jamaica, between 9.00 a.m. on 7th November, 1958 to 12.00 noon on 7th December, 1958. Applications for Tender Documents are to be accompanied by a certified cheque for £100 which will be returnable on receipt of a bona fide tender. Completed tenders are to be addressed to the Permanent Secretary, Ministry of Development, P.O. Box 512, Kingston, Jamaica W.I. and marked "Tender for Negril Development Scheme" to reach him not later than 7th January, 1959.

Bids: January 6, 1959

Contract NYA—920.009

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
RUNWAY V' APPROACH LIGHT PIER

Sealed proposals for the construction of an approach light pier for Runway V' at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, January 6, 1959, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, December 4, 1958

Bids: February 5, 1959

Kingdom of Thailand
Royal Irrigation Department
Bangkok, Thailand

The Royal Irrigation Department of the Kingdom of Thailand requests sealed written bids for furnishing and delivering fob contractor's shipping point for the Bhumiphol Dam and Power Plant, Yanhee Multipurpose Project, Kingdom of Thailand, in accordance with the Contract Documents, Invitation for Bids, No. YS-1-1, the following equipment:

Tractor units; flatbed, van, bottom-dump, and refrigerator semitrailers; wrecker, van, flatbed, and utility trucks; fork lift trucks; marine Diesel engines; and road vehicle weighing scale.

Bids will be opened at 10:00 a.m., 5 February, 1959. Copies of the Contract Documents, Invitation for Bids, No. YS-1-1, may be obtained by qualified Bidders on written request on Bidder's letterhead, addressed to Royal Irrigation Department, Attention: Thai Liaison Engineer, c/o Engineering Consultants, Inc., 1940 West Mississippi Avenue, Denver 23, Colorado, U.S.A. Each request must be accompanied by a check or money order, payable to the Royal Irrigation Department, in the amount of U. S. $10.00 for each copy of the Contract Documents requested.

M. L. Xujati Kambhu
Director General
Royal Irrigation Department

INVITATION FOR BIDS—ALEXANDER HAMILTON AIRPORT, ST. CROIX, VIRGIN ISLANDS, PROJECT NO. SC-2-18-40, GOVERNMENT OF THE VIRGIN ISLANDS, BY CONTRACTING OFFICER, DEPARTMENT OF PROPERTY AND PROCUREMENT, DIVISION OF PROCUREMENT. Sealed bids in single copy for furnishing all labor, equipment and materials and performing all work for the project described herein will be received until 2:00 P.M. Atlantic Standard Time Jan. 15, 1959, in the office of the Division of Procurement, Old Grammar School Building, Kings Street, Christiansted, St. Croix, Virgin Islands (First floor-Western Section), and then *publicly* opened. Information regarding bidding material, bid guarantee, and bonds, plans and specifications and other contract documents are open for public inspection at the Office of the Commissioner of Public Works, Charlotte Amalie, St. Thomas, Virgin Islands; Deputy Commissioner of Public Works, Christiansted, St. Croix, Virgin Islands; Bellante and Clauss, Architects-Engineers, Mears Building, Scranton, Penna.; Deputy Public Works Advisor, Office of Territories, Department of the Interior, Interior Building, Washington 25, D. C.; A.G.C. Office, 1113 Congress Building, Miami, Florida; Division of Procurement, Old Grammar School Building, Kings Street, Christiansted, St. Croix, Virgin Islands (First Floor-Western Section); Builders Exchange, 46 N. E. 6th Street, Miami, Florida and Home Finance Agency, Community Facilities Administration, 1608 Ponce de Leon Avenue, Santurce, 17, Puerto Rico. Plans and Specifications may be procured from Bellante and Clauss, Architects-Engineers, Mears Building, Scranton, Penna., or the Division of Procurement, Old Grammar School Building, Kings Street, Christiansted, St. Croix, Virgin Islands (First Floor-Western Section) upon deposit of $50.00 which shall be refunded to bona fide bidders upon the return of the plans and specifications in good condition within twenty (20) calendar days from the date of bid opening. To persons who procure plans and specifications upon the deposit of $50.00 and who do not submit a bid, one half the amount deposited will be refunded upon the return thereof in good condition within ten (10) calendar days from the date of bid opening. No refund will be made for return after that time. Each bid must be accompanied by a satisfactory bid security (certified check or bid bond) in an amount not less than 5% of the total bid in dollars and cents. The successful bidder will be required to furnish a performance and payment bond, each in the amount of 100 per cent of the contract price. No bid may be withdrawn until forty five (45) calendar days after the scheduled closing time for the receipts of bids. The Government reserves the right to award a contract for the project on the basis of the acceptance of any or all of the schedules or alternates, whichever course is in the best interest of the Government of the Virgin Islands. DESCRIPTION OF WORK:—Perform all work for the redevelopment of Alexander Hamilton Airport which project includes grading and paving of airfield runway, taxiway, aircraft parking apron grading and pavement, access road and auto parking, grading and pavement, airfield lighting, a terminal building, a fire and crash maintenance building and allied utilities. Wages paid on this contract must equal the minimum as stated in the Department of Labor Decision of the Secretary of Labor No. T-2,837 dated October 1, 1958. Copy attached.

Bids: December 23, 1958

Sewage Treatment Plant

Sealed bids for the construction of Sewage Treatment Plant for the Gates-Chili-Ogden Sewer District will be received by the Monroe County Sewer Agency at its office at 407 Terminal Building, 65 Broad Street, Rochester 14, New York, until 11 o'clock A.M., E.S.T., on the 23rd day of December, 1958.

Bidding forms can be obtained and plans and specifications examined at the office of the Monroe County Sewer Agency or the office of the Lozier Company, Engineers, 10 Gibbs Street, Rochester 4, New York.

Copies of plans and specifications may be obtained upon the payment of Twenty-Five Dollars ($25.00) for each set. The full amount charged will be returned to all bidders who return the complete plans and specifications in an acceptable condition within thirty (30) days from the date of award to the successful contractor. Half of the amount charged will be returned to non-bidders who return the complete plans and specifications in an acceptable condition within thirty (30) days from the date of award to the successful contractor. Checks or money orders should be made payable to the order of Clarence A. Smith, Monroe County Director of Finance.

The work consists of the construction of: SECTION "F"—Sewage Treatment Plant: —General, Plumbing and Process Piping, Heating and Ventilating and Electrical and Instrumentation.

COUNTY OF MONROE
By C. A. Bennett
Purchasing Agent

November 28, 1958

Bids: January 5, 1959

Village of Marcellus, New York
Sewage Treatment Works

Sealed proposals will be received by the Village Clerk at the Village Office, Marcellus, New York until 8:00 P.M. on the 5th day of January, 1959 at which time they will be opened and read aloud. The proposals are for Contract No. 1 "General" and Contract No. 2. "Electrical" covering the construction of certain additions and alterations to the Marcellus Sewage Treatment Plant and a Sewage Lift Station and Force Main near Main and Orange Streets.

Plans, Specifications and Proposal forms may be obtained at the Village Office, Marcellus, New York upon depositing $20.00 with said Village Clerk to be held as security for their return, pursuant to law and may be examined at the Office of the Engineer, Donald E. Stearns, P.E., Civil and Sanitary Engineers, 99 Albany Street, Cazenovia, New York.

After opening and reading said bids, said Village reserves the right to reject any or all bids and readvertise for new bids or award a contract, by acceptance of any bid complying with said Plans, Specifications and Terms, to the lowest responsible bidder furnishing the requested security after advertisement hereof, pursuant to law. The final awarding of Contract is subject to the approval of the United States Department of Health, Education and Welfare.

M. A. Morrocco, Village Clerk
Village of Marcellus, N. Y.

U. S. Government

Department of Commerce, Bureau of Public Roads, November 21, 1958. SEALED BIDS will be received at the office of the Bureau of Public Roads, Gatlinburg, Tennessee, until 11:00 a.m., E.S.T., DECEMBER 19, 1958, for Project 3W2, Blue Ridge Parkway, Haywood and Jackson Counties, North Carolina, Grading, Draining, Crushed Aggregate Base, Tunnel with Lining, and other work from Racking Horse Gap 8.173 miles to Balsam Gap. The approximate quantities of the more important items are 120 Acres Clearing and Grubbing, 900,000 cu. yd. Unclassified Excavation, 21,000 cu. yd. Excavation for Tunnel, 53,000 Tons Crushed Aggregate Base, 920 cu. yd. Stone Masonry, 825 lin. ft. Concrete Tunnel Lining, 190,000 lb. Structural Steel Tunnel Lining, and 9,045 lin. ft. Concrete or Corrugated Metal Culvert Pipe. Minimum wage rates have been fixed as required by law. Plans, specifications and proposal forms are available upon request at the office of the Regional Engineer, 1440 Columbia Pike, Arlington 4, Virginia, or at the address given above. A. F. Ghiglione, Regional Engineer.

OFFICIAL PROPOSAL

RATE: $2.40 per line (or fraction) per insertion.

CLOSING DATE: 10:30 a.m. Friday for issue out following Thursday.

SEND COPY: Official Proposal Division, Class. Div., Engineering News-Record, P. O. Box 12, New York 36, N. Y.

OFFICIAL PROPOSALS

Bids: January 6, 1959

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
For the Sale of Tunnel Gates and Appurtenant Metalwork Salvaged from Long Sault Dam near Massena
St. Lawrence County, New York
Specifications No. PA-5-15080
St. Lawrence Contract No. P 43

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals from prospective purchasers of tunnel gates and appurtenant metalwork salvaged from Long Sault Dam, near Massena, St. Lawrence County, New York until 10:30 A.M., Eastern Standard Time on the 6th day of January, 1959, at the Authority's office, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The quantities of the principal items of equipment and material to be sold are as follows:

27 Fixed wheel gates, designed for closure of 16 x 19 foot tunnels under 80 foot head.
Approx. 150 tons 1¼" x 8" gate suspension bars of assorted lengths, with pins.
1 Gate lifting beam assembly.
28 36" WF 160 beams, each approximately 58 feet long.
Approx. 25 tons Miscellaneous fabricated structural steel.
Approx. 5,300 sq. ft. ⅜" thick checkered steel plate.
Approx. 2,000 lin. ft. 1½" steel pipe hand railing.

All equipment and material which is purchased shall be completely removed from the St. Lawrence Power Project on or before June 1, 1959.

Bids will be considered on any number of gates from one to twenty seven and on any bid item or combination of bid items for appurtenant metalwork.

Plans, Specifications and Proposal Forms for the equipment and material to be sold may be obtained from the Power Authority of the State of New York, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at no cost, upon written application. Plans, Specifications and Proposal Forms for the equipment and material to be sold will be on file in the Authority's office and in the office of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the total amount of the bid.

The right is reserved to make award on any bid or combination of bids and to reject any or all bids.

W. S. Chapin
General Manager

Bids: December 9, December 17, 1958

Triborough Bridge and Tunnel Authority

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:

Until 11 A.M. on Wednesday, December 17*, 1958

For Throgs Neck Bridge Contract No. TN-11, Queens Interchange. The bid must be accompanied by a deposit in the amount of $80,000.00.

Plans, specifications and contract documents may be purchased at the office of the Authority for $45.00, which will not be refunded.

Until 11 A.M. on Tuesday, December 9, 1958

For Throgs Neck Bridge Contract No. TN-9, Electrical Work Suspended Structure and Approaches. The bid must be accompanied by a deposit in the amount of $80,000.00.

Plans, specifications and contract documents may be purchased at the office of the Authority for $25.00, which will not be refunded.

Opening Date for bids on Contract TN-11 has been changed from Dec. 10th to Dec., 17th.

OFFICIAL PROPOSALS

Bids: December 18, 1958

New Jersey Turnpike Authority

CONTRACT NO. PE-21

Proposals are invited for Contract No. PE-21 which involves the installation of additional lighting facilities and other incidental work at Interchange No. 6 to the Pennsylvania Extension of the New Jersey Turnpike in Burlington County, New Jersey.

The principal items of work include:

Trenching and Backfilling	6,100 Lin. Ft.
Metal Conduit	5,480 Lin. Ft.
Asbestos-Cement Conduit	1,270 Lin. Ft.
Series Lighting Conductor	14,100 Lin. Ft.
Twin-Arm Lighting Standards	23 Units
Double Guard Rail Median Barrier	5,140 Lin. Ft.

Proposals will be received at the New Jersey Turnpike Authority Administration Building, New Brunswick, New Jersey, until 11:00 O'Clock, Eastern Standard Time, on the morning of December 18, 1958, at which time and place said proposals will be publicly opened and read.

Each bidder must submit with his proposal a Contractor's Financial and Equipment Statement.

Contract documents may be examined during office hours on or after November 25, 1958, at the office of the Authority and at the office of the Consulting Engineers, Howard, Needles, Tammen & Bergendoff, 99 Church Street, New York 17, New York. Contract documents will be furnished upon payment of Five Dollars ($5.00) for each set, upon application to the Authority. Contract documents are not required to be returned and the payment will not be refunded.

NEW JERSEY TURNPIKE AUTHORITY
Joseph Morecraft, Jr., Chairman
November 21, 1958
PE-21
Rev. 11/13/58

OFFICIAL PROPOSALS

U. S. Government

CIVIL AERONAUTICS ADMINISTRATION Sealed bids (Invitation No. 9-3345B1) will be received at Washington, D. C. until 2:00 P.M., E.S.T., Friday, December 19, 1958, for furnishing all labor, equipment, and materials and performing all work in connection with the development of the Washington International Airport in Fairfax and Loudoun Counties, Virginia, pertaining to the excavation and grading of Runway 11L-29R, including taxiways and all related drainage; and the paving of Runways 18L-36R, 18R-36L, and 11L-29R including taxiways, turnouts, shoulders, and related duct and other underground installations. Performance is desired within 600 calendar days from and including effective date of Notice to Proceed. Bid forms, plans, and specifications may be obtained from Procurement Division, Civil Aeronautics Administration, Room 2615, T-5 Building, Washington 25, D. C., accompanied by deposit of $25.00 for each set of plans and specifications desired. Deposits will be refunded upon return of plans in good condition not later than thirty (30) calendar days from date of bid opening.

ADDITIONAL PROPOSAL ADVERTISEMENT ON PAGE 122.

EMPLOYMENT OPPORTUNITIES

ADDRESS BOX NO. REPLIES TO: Box No.
Classified Adv. Div. of this publication,
Send to office nearest you.
NEW YORK 36: P. O. BOX 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

• *POSITIONS VACANT*

Highway Engineers—Highway Engineers with a minimum of 3 years experience. Excellent opportunity with established consulting engineering firm in Middle West. P-7909, Engineering News-Record.

Assist. Prof.—To teach undergrad. courses in structures and mechanics. Salary open. Civil Eng., Univ. of No. Dak., Grand Forks.

Electronic Computer Application Engineer Wanted. Midwestern consulting Engineering firm needs graduate engineer experienced in electronic computer application to engineering problems. Reply in detail to P-9211, Engineering News-Record.

Construction—spare parts manager, heavy equipment maintenance superintendent, warehouse superintendent. Good long term positions available for top men. Overseas—temperate climate. Please send detailed resume including foreign languages known, salary desired, etc. P-9363, Engineering News-Record.

Mechanical Engineers—Experienced in design calculations, equipment selection and arrangement, process and service piping layouts for chemical plants or paper mills. Position with Consulting Engineering firm in Georgia. State education and experience. P-9360, Engineering News-Record.

Wanted—Estimator to assemble complete general construction bids. Must be heavy on concrete and masonry. Westchester contractor. P-9369, Engineering News-Record.

Estimator—Experienced for General Contractor engaged in construction of industrial and commercial buildings. Well established firm in Southern Connecticut offering permanent position with good future for properly qualified man. Reply giving complete resume of education, experience, etc. P-9431, Engineering News-Record.

Estimator wanted by Paving and Concrete Contractor. Prefer Graduate Engineer with 5 years experience. Permanent Position. Location N.Y.C. P-9314, Engineering News-Record.

Mechanical Engineer for permanent position in medium sized Engineering Department. Exceptional advancement opportunities with a growth company. Prefer man with 5 to 10 years experience and with M.E. degree or equivalent. Familiar with design and construction of electrical and mechanical machines and equipment. P-9355, Engineering News-Record.

Hydraulic Engineers—Experienced in hydraulic design of channels and bridges, and/or design and construction of dams, for Commonwealth of Pennsylvania, Department of Forests and Waters. Duties include review of plans and specifications, report writing, field investigations and inspections, with some travel and public relations. Salary depending on experience. Location—Harrisburg, Pennsylvania. Write State Civil Service Commission, Health and Welfare Building, Harrisburg, Pennsylvania.

Wanted Architectural Draftsman with 2 or more years experience. Excellent opportunity with established consulting engineering firm in middle west. State education, background and experience. Reply to P-8590, Engineering News-Record.

Wanted Registered Architect with 4 or more years experience. Excellent opportunity with established consulting engineering firm in middle west. State education, background and experience. Reply to P-8615, Engineering News-Record.

Wanted: Young graduate Engineer, preferably single, interested in overseas assignment with Consulting firm. State education, background and experience. Reply fully to P-8394, Engineering News-Record.

New Jersey State Department of Conservation and Economic Development has immediate vacancies for graduate civil engineers with two years experience in water supply, flood control, hydraulic or hydrographic engineering. Submit details and qualifications to Division of Water Policy and Supply, 520 East State St., Trenton 25, N. J.

(Continued on opposite page)

EMPLOYMENT OPPORTUNITIES

NATIONAL COVERAGE

DISPLAYED RATE:

The advertising rate is $39.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured 7/8" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

DECEMBER 18th ISSUE CLOSES DECEMBER 8th

UNDISPLAYED RATE:

$2.40 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take ½ of above rate.

Box numbers—count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to agency Commission.

Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36.

ENGINEERING DESIGN PERSONNEL

Highway & Bridge Designers, Highway & Bridge Draftsmen

Openings in Pennsylvania, Ohio, Maryland & West Virginia

Career opportunities for individuals interested in professional recognition ample opportunity for advancement based on merit, plus employee retirement plan, group life insurance, hospitalization, paid vacation and holidays.

EXPERIENCE REQUIRED

Mail Resume To F. W. AHERN, Personnel Director

MICHAEL BAKER, JR., INC. *Consulting Engineers*

Baker Building Phone: SPruce 4-3010 Rochester, Penna.

ENGINEERS

PERMANENT OPENINGS FOR QUALIFIED MEN EXPERIENCED IN THE DESIGN OR SPECIFICATIONS FOR

AIRPORTS
BRIDGES
BUILDINGS
HIGHWAYS
RAILROADS

PREFER GRADUATE REGISTERED ENGINEERS WHO SEEK LONG RANGE EMPLOYMENT WITH AMPLE OPPORTUNITY FOR PROFESSIONAL DEVELOPMENT AND ADVANCEMENT IN A STEADILY EXPANDING AND GROWING ORGANIZATION.

Paid vacation, sick leave, holiday, overtime. Excellent Employee Benefits Plan provides retirement income plus life and disability insurance. Blue Cross. Moving allowance.

Work will be in the general offices in St. Louis. Interviews can be arranged in Washington, D. C., and San Francisco also.

Please write fully, including salary data, to

SVERDRUP & PARCEL, Inc.

ENGINEERS — ARCHITECTS

915 Olive St. Louis 1, Mo.

• *POSITIONS VACANT*

(Continued from opposite page)

Wanted: General Superintendent for permanent location with expanding construction company doing asphalt, grading and allied types of construction in a growing Southern capital city. Only the highest caliber man will be considered. Best management ability and leadership necessary. Ability to evaluate and handle varied and fast moving situations involving men and equipment required. Applicant must be capable of meeting and dealing with the public. Salary and percentage bonus. Engineering degree desirable. Send resume to P-9407, Engineering News-Record.

Quality Control Manager Structural Steel. Northern Virginia Fabricator of structural steel for buildings and bridges and other related work requires an experienced man to set up and operate inspection department. Job prequalification, in process inspection and final inspection included in scope of responsibility. Minimum of 15 years experience in industry required. Write P-9420, Engineering News-Record.

Estimator—At least five (5) years experience estimating institutional, commercial and industrial construction under our Chief Estimator in Ohio-Michigan area. Graduate Engineer preferred but not necessary. Salary commensurate with experience. Good opportunity for right man. P-9414, Engineering News-Record.

Project Manager wanted for large steam generating plant project in mid-west. Must have experience in entire construction operation from pile foundation to final test. Give references and experience. Salary open. P-9415, Engineering News-Record.

Assistant City Engineer—Age, under 30— Civil Engineer—College Degree—two (2) years' experience. Knowledge of street and sewer design and other Municipal functions. Knowledge of operation of Sewage Treatment Plant and Filtration Plant desirable. Write Civil Service, City Hall, Cumberland, Maryland.

Civil Engineer wanted as instructor in Civil Department of South's leading Technical Institute. Position to begin January 5, 1959. B.S. Degree and work experience preferred, but will consider recent graduate. Contact C. T. Holliday, Southern Technical Institute, Chamblee, Georgia.

Superintendent, Steam Power Plant Construction. Midwestern engineering and construction company has opening for experienced man. Intimate knowledge of structural and mechanical phases necessary. Engineering degree desirable. Permanent position for right man. Salary commensurate with ability. P-9422, Engineering News-Record.

Wanted: Office Manager and Accountant for firm in sewer and bridge construction. State all qualifications, experience, and salary expected. Location, Southern Indiana. P-9429, Engineering News-Record.

(Continued on the following page)

CHIEF ESTIMATOR—The man we are looking for has had a substantial background of successful experience bidding competitive building construction work for general contractors engaged in multi-million dollar projects. He is ready to take over and assume full responsibility of a chief estimator.

We have an exceptional opportunity to offer this man. We presently operate on a nationwide basis, but plan to expand our operations especially throughout the mid and far western states. We can offer a key position in this expansion program and an opportunity to grow with a growing company.

Write full details, covering experience, education, references, personal data and salary requirements.

Director of Personnel
BLOUNT BROTHERS CONSTRUCTION COMPANY
P. O. Box 949, Montgomery, Alabama

CONSTRUCTION ENGINEER

An expanding midwest pharmaceutical company has an opportunity for a field engineer to keep in contact with the details of construction work such as proper backfilling, adequate piping testing, utility piping, all mechanical work, proper concrete mixes, etc. This man should have 6-10 years of varied experience in both mechanical and structural phases of construction. Write stating background and experience to:

Technical Employment Coordinator
THE UPJOHN COMPANY
Kalamazoo, Michigan

WANTED

ESTIMATING ENGINEER

Midwestern consulting engineering firm needs engineer with estimating experience for contractors and with consulting experience to organize and head estimating.

P-9003, Engineering News-Record
330 N. Michigan Ave., Chicago 11, Ill.

CONTRACTORS ENGINEER WANTED

College degree in Engineering or equivalent in experience. Job consists of estimating, purchasing, and overseeing jobs from the office of an expanding contractor in southwest Michigan. Give age, outline of education and experience, salary expected, and snapshot of yourself if available. Write

P-9332, Engineering News-Record
330 N. Michigan Ave., Chicago 11, Ill.

Steel Design Engineer

Graduate Engineer interested in full time, permanent employment with nationally prominent structural steel fabricator located in St. Louis. Paid vacations, pension plan and group insurance provided. Experience required, preferable age 30-40. Excellent opportunity for right man interested in structural design.

Reply in writing giving education, age, present salary, and experience resume.

P-9340, Engineering News-Record
520 N. Michigan Ave., Chicago, Ill.

(Continued from preceding page)

• EMPLOYMENT SERVICE

Salaried Personnel $5,000-$30,000. This nationwide service successful since 1927 finds openings in your field. Sells your abilities; arranges contacts. Present position protected. Write for details—Jira Thayer Jennings. P. O. Box 674, Manchester, Vermont.

• POSITIONS WANTED

Const. Supt. twenty six years responsible charge of grading and drainage, asphalt paving, flood control, and bridges. PW-9312, Engineering News-Record.

Const. Supt. 28 yrs experience in commercial buildings. Available now. PW-9328, Engineering News-Record.

Civil Engineer, Engineer-in-Training N. Y. State, eligible for Part III & license February 1959. BSCE, experience in structural design and construction also public works engineering. Avail Jan. 1959. Former US Navy, CEC Officer. Will relocate anywhere in U.S. PW-9294, Engineering News-Record.

Civil Engineer, Eligible for professional licensing. Desires City Engineer job, salary and location open. BSCE 1953. PW-9304, Engineering News-Record.

Graduate Civil Engineer, age 33. Desires engineering or management position. Background of estimating and engineering on heavy construction, tunnel, and sewer work. Resume to all replies. PW-9361, Engineering News-Record.

Construction Engineer, 33, BSCE, ten years experience with consultants and contractors as superintendent of construction. Toll and State Highways, water and sewage work. Available January 1. P.O. Box 102, Dundee, Illinois.

Civil Engineer, B.S.C.E. 1958 graduate, Canadian, 24. Seeks overseas employment in construction field. Three summers construction experience. PW-9367, Engineering News-Record.

BSCE, PE, 31, 3 years structural design, 3 years industrial construction supervision, desires sales engineering position with future management opportunities. PW-9338, Engineering News-Record.

Construction Supt., age 45, 29 yrs experience in mass & reinforced concrete const., erecting bridges, dams, power houses, office & manufacturing bldg's., engineer & design experience, resume on request, locate anyplace in U.S. PW-9372, Engineering News-Record.

Construction Supt. General Construction. PW-8896, Engineering News-Record.

Registered Civil Engineer, 38, two years plant, eight years construction engineering, seeks association with small consulting firm, Midwest Area. Available January 1. PW-9432, Engineering News-Record.

Civil Engineer, BSCE from RPI, EIT, 24; 2 years experience in steel design, fabrication and estimating, 1 year heavy construction. Desire position with contractor, consultant or mfgr. in Conn., Mass., or Upstate N. Y. No military obligations. PW-9406, Engineering News-Record.

Registered Civil Engineer, 20 yrs. experience water supply, sewer, dams, etc., design thru construction; fluent Spanish; locate anywhere. Please state exact duties, salary offered. PW-9380, Engineering News-Record.

Civil Engineer, BS in CE, MCE, PE in New York and New Jersey. AMASCE, NSPE. 30 years design bridges, port development and piers, and industrial buildings. Past 7 years Chief Civil Engineer of major chemical company on site development, structural, architectural and associate design specialties. PW-9405, Engineering News-Record.

Construction Superintendent, Project Manager, Negotiator. Foreign and U.S. experience. Utilities, roads, mass housing, general construction. PW-9403, Engineering News-Record.

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• POSITIONS WANTED

Const. Supt. 20 years experience in charge of industrial, chemical plants, oil refineries, power houses and general construction. Anywhere, salary open. PW-9418, Engineering News-Record.

Electrical Superintendent, 25 years experience in construction of power houses, industrial plants, substations, transmission lines, and distribution lines. Will relocate. PW-9413, Engineering News-Record.

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Prestressed Concrete Plant Manager or Superintendent BCE. 30. 8 years heavy construction experience in supervisory capacity including 4 years as Field Engineer, Plant Supt. and Plant Manager with major firm engaged in manufacture and installation of prestressed concrete structures. Desire locate in South or West Coast. PW-9425, Engineering News-Record.

Field Constr. Engr. Surveyor, age 47, experienced heavy construction, large projects, available now. PW-9435, Engineering News-Record.

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Paulton Building, Sioux Falls, South Dakota

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W-9385, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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Your requirements will be brought promptly to the attention of the equipment dealers advertising in this section. You will receive replies directly from them.

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10,000' 6" x 6" road forms
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Good Condition Price—$4500.00

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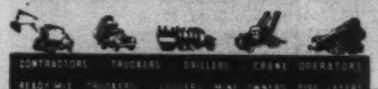

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VAlley 5-8511

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Mechanical—Electrical
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Topographic Maps — Photogrammetry
Highways, Utilities, Structures
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Soils Engineers
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(Continued from page 114.)

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DISTRICT No. 1, G. L. NICKERSON, District Engineer, 353 Broadway, Albany 1, New York						
Greene (Rte. 385)	FARC 58-167	Catskill-Athens, S. H. 5367 Proj. F-365(8)	0.67	Asphalt Concrete = 0.56 Mile Miscell. Work = 0.01 Mi. Comp. W-F Beam Bridge 128'	$21,000 Plans $5	$386,000
Saratoga & Warren (Int. Tour. Rte. 87)	FISH 58-19	Interstate Route 502 (Route 9 to North Bank of Hudson River); Glens Falls-Saratoga, Pt. 1, S.H. 58; Spiers Falls Co. Rd. 24; Spiers Falls Road-Redmond Road Connection & Butler Road Proj. I-1119(24)	2.74 (5.00 Acc.)	9' Cem. Conc. Pavt. 2 @ 24' Var. Wide = 2.69 Miles Cement Conc. Pavt. (Ramps) = 2.09 Mi. Asphalt Conc. = 1.28 Mi. Top Course Graded Gravel = 0.91 Mi. Miscell. Work = 0.17 Mi. 4 Hy. Steps. Comp. I-Beams 364.3' (5 Sp.), 135.5' (3 Sp.), 140.3' (3 Sp.) & 247' (4 Sp.) 1 Bridge Comp. Weld. Plate Girder 728' (5 Sp.)	$330,000 Plans $10	$6,369,000
Schenectady (Int. Tour. Rte. 890)	FIC 58-28	Interstate Route Connection 550 (Campbell Rd. to Crosstown Connection) Proj. I-523(15)	0.23	Demolition of Buildings	$2,000 Plans $5	$37,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

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CANADA

Construction & Industrial Equipment

Northern Machine Works Limited of 430 Main Street, Bathurst, New Brunswick, now under new and aggressive management, is desirous of negotiating with U. S. firms who may want to have their products manufactured and marketed under license in Canada.

They are also interested in taking on additional products of U. S. manufacture for distribution and servicing in Canada.

Founded in 1919, and incorporated in 1945, the company produces earth-moving, construction and snow removal equipment, as well as miscellaneous industrial steel fabrications.

Northern Machine Works has approximately 50,000 square feet of modern manufacturing space, including well-equipped machine and fabricating shops, and a well qualified engineering department. The plant is favorably located with respect to transportation facilities and the supply of skilled labour.

The company is well-known and established with industry across the country. And U. S. firms interested in this proposal are asked to write direct to: Northern Machine Works Limited, P. O. Box "K", Bathurst, New Brunswick, Canada; for attention: Mr. A. J. Fenwick, President.

Khrushchev's Challenge

EVERY AMERICAN who has any concern for his own future and that of his children had better give some serious thought to what he is going to do, personally, about the challenge to that future issued by Russia's Khrushchev in his new plans for the economic growth of the Soviet Union (ENR Nov. 7, p. 23).

Labor leaders who pull strikes, which set back our own economic growth by depriving workers of wages and management of income, are gambling with that future. So are workmen who oppose the installation of labor-saving machinery that would increase productivity. So is management that is not alive to the need for such machinery, not progressive enough to invest heavily in research and not concerned enough to manage dynamically. And so are political leaders who do not encourage business growth and prosperity by every possible means.

The fact is that Mr. Khrushchev can marshal the capabilities to reach the economic goals he has set for his Seven Year Plan. All authorities seem to agree on that. And once these goals are reached, the further step to the Fifteen Year Plan goals will be less difficult. These latter goals are the ones that bring Soviet production of such basic items as coal, crude oil, electric power, steel and cement up to and even ahead of U.S. production today. They are also the goals that Khrushchev uses to bolster his claims that the U.S.S.R. will then enjoy the highest living standards in the world.

Obviously, unless the U.S. stands still economically during the next decade, Khrushchev is talking through his hat. The danger is not that we will fail to grow, but that we will fail to grow fast enough to keep our superiority and leadership. Should that happen, Russian influence would quickly spread, with a Soviet-dominated world all but inevitable. That is the reason why such bad economic habits as those mentioned earlier should be cause for concern.

Russia, for its part, will not be bothered with strikes. It will not hesitate to use machines to increase worker productivity. It will not stint on research. It will not fail to educate its engineers and scientists. And its political leaders will do everything in their power to encourage the economic growth that is so urgently needed to reach its goals.

It is important to keep a few of these Soviet goals in mind: Steel productiton, now 55 million metric tons, to be 90 million in 1965 and 107 million in 1972, compared to U.S. 1957 production of 102 million; electric power, now 233 billion kwh, to be 500 billion in 1965 and 900 in 1972, compared to 1957 U.S. generation of 716 billion; and cement, now 204 million bbl, to be 480 million in 1965 and 700 million in 1972, compared to present U.S. capacity of 392 million. Already, Russia's coal production of 475 million metric tons exceeds U.S. production, and the 1965 Russian goal is 600 million tons.

To attain these goals the U.S.S.R. will have to continue, as over the past few years, to increase its industrial production at a rate of nearly 9% a year. This is more than twice the rate considered satisfactory for the U.S. There is no reason for us to match the Russians ton for ton, since their needs are so much greater than ours, but to fall behind our own healthy rate of growth could be dangerous indeed.

Khrushchev's goals constitute an order to the Soviet people, which they must carry out—or else. Recent history indicates that they can. His goals are likewise a challenge to the American people to keep our economic system healthy and growing. And the challenge to us is also "or else," for the Khrushchev plan is a threat to our future. Every American has a stake in seeing that the challenge is met.

Kettering's Contribution

THE DEATH of Charles F. Kettering last week removed a man who did as much as any single individual to make the United States a country whose technological capabilities have become fascinating goals for a Khrushchev to shoot at. By useful inventions, technological leadership, dynamic business example and, finally, generous giving for medical research, Mr. Kettering provided the world with a shining example of free, personal, private enterprise in action in a democracy. The Kettering contribution to the American way of life was immense. The Khrushchev challenge can more easily be met because of it.

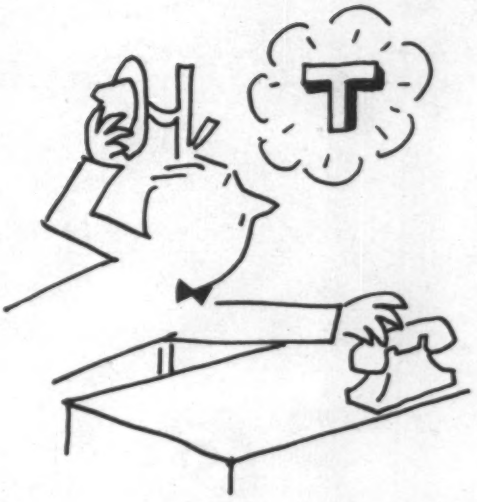
Both engineers and scientists owe a great deal to Charles F. Kettering. And much of this debt results from the fact that he championed their causes before the general public with his great gift of imparting technological wisdom in homely form. To wit, Kettering's "first law" of mechanics, "You can't push something that is going faster than you are."

He also endeared himself to the man in the street by claiming to be just a "tinkerer" and a "pliers and screwdriver" engineer. Then when he set up such an obviously fundamental research project as the study of the molecular structure of chlorophyll, the cause of fundamental research of every kind benefited because Mr. Kettering was identified with it.

Mr. Kettering could champion the cause of engineering and science because he dealt from the strength of great accomplishments in these fields himself, personally and as the long-time head of all General Motors research. The world—ours and even Mr. Khrushchev's—could use more men with the knowledge, integrity and vision of a Kettering. His great contributions constitute a legacy that will benefit America for many years to come.

1.

A vast and costly stadium was voted by the town,
Among the last to hear the news was able builder Brown.
He had returned that morning from a project out of state.
He groaned as he prepared his bid, "I hope I'm not too late!"

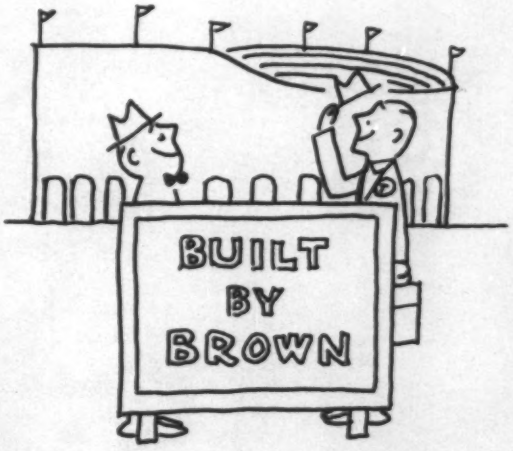


2.

He rushed to call his Travelers man, "Can you come out tonight?
That ball park bid! I need a bond. It must be *fast* and *right*."
The Travelers man replied, "Why, sure! Be at your house at eight!"
So Brown went home to wife and kids delighted with his fate.

3.

"How can you be so confident?" his wife asked with a frown.
"Because I trust my Travelers man," said happy Mister Brown.
"He's expert with those local laws that slow the bond you need.
He knows that time is money, so a bond arrives with *speed*."



4.

And right as rain and on the dot, Brown had his bond in hand.
Behind a signboard "Built by Brown" the stadium looks grand!
For fast and friendly service, think of Travelers when you plan.
A Travelers bond is always right. So call your Travelers man!

NOTE: *Comp, Equipment Floaters—Builders' Risk Insurance, too Are other ways The Travelers helps a contractor like you.*

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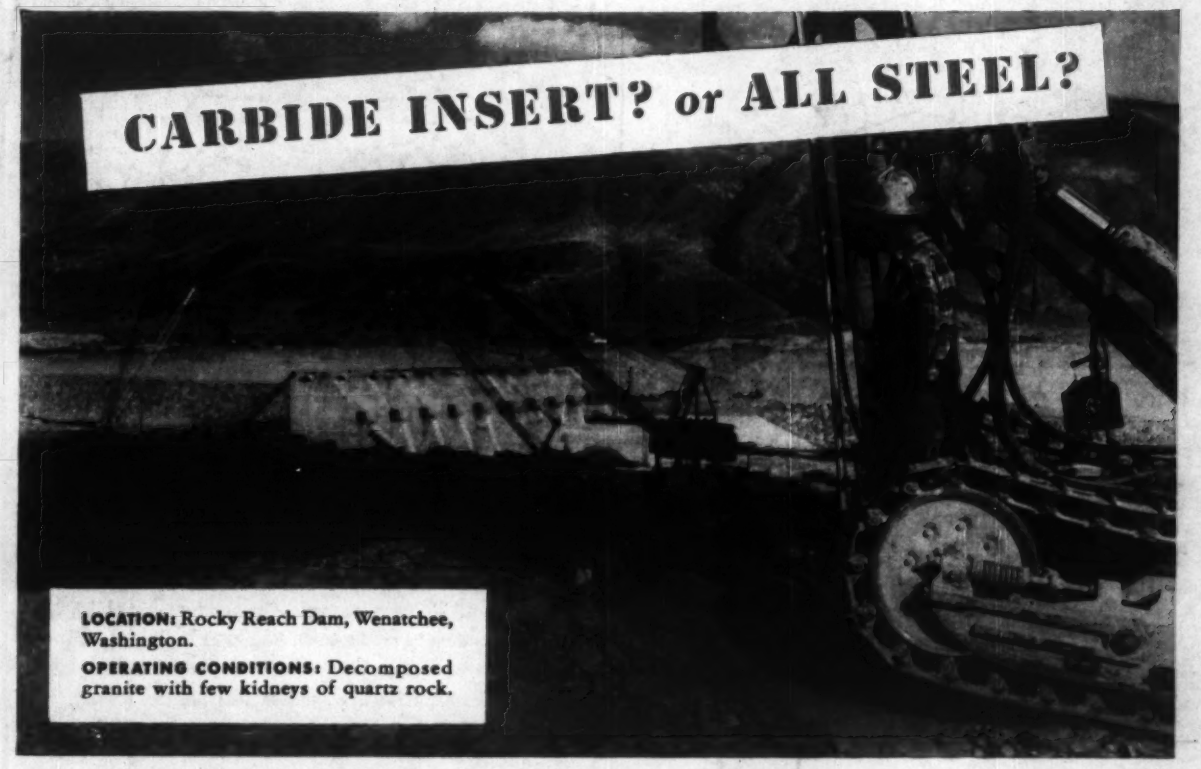
Insurance Companies
HARTFORD 15, CONNECTICUT

All forms of business and personal insurance including Life • Accident • Group • Fire • Marine • Automobile • Casualty • Bonds


CARBIDE INSERT? or ALL STEEL?
LOCATION: Rocky Reach Dam, Wenatchee, Washington.
OPERATING CONDITIONS: Decomposed granite with few kidneys of quartz rock.

"We drill 1400 to 2000 feet of blast hole per bit with TIMKEN® carbide insert bits"

...Reports Goodfellow Brothers, Inc.

DRILLING to relocate the Great Northern Railroad and Highway near Wenatchee, Washington, Goodfellow Brothers, Inc. selected Timken® carbide insert bits to drill blast holes in the decomposed granite and kidneys of quartz rock. Regrinding both gauge and flutes, they got 1400 to 2000 feet of blast hole from every bit.

That's the kind of performance you get with Timken carbide insert bits when conditions call for them. Their five front holes and deeper wing clearance help clear chips faster. You drill rock instead of chips.

But carbide insert bits may not always be your best bet. In ordinary ground, you'll save more with Timken all-steel bits. With correct and controlled reconditioning, they give you lowest bit cost per foot of hole when you can drill out full increments of steel.

But whatever your drilling conditions and whatever type of bit you use, your drillers will save time and you'll save money with Timken bits. They're all interchangeable in the same thread series. Your drillers can change bits as fast as the ground changes—without changing drill steels.

All Timken bits are made of Timken electric furnace fine alloy steel. We're the only American maker of removable rock bits who takes that extra step. And you get extra protection from a special shoulder union that protects threads from drilling impacts.

Get the right and most economical bit for your drilling jobs. Call or write: The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable: "TIMROSCO".

Timken threaded all steel multi-use rock bit

Timken threaded carbide insert rock bit

TIMKEN *your best bet for the best bit for every job*

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